Achievement Gaps in Iowa

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Executive Summary

Gaps exist in the achievement of Iowa students. In 2010, the percent of all students in grade four enrolled for full academic year (FAY) scoring proficient, as measured by the Iowa Tests, was 78.5 percent. The percent of Black (54.5 percent), Hispanic (61.2 percent), free or reduced lunch eligible (66.6 percent), or English Language Learner (ELL) (51.3 percent) students was considerably less. Similarly, in eighth grade mathematics, the percent of all students enrolled for full academic year scoring proficient was 76.5 percent. Again, the percent of Black (45.9 percent), Hispanic (59.9 percent), free or reduced lunch eligible (62.1 percent), or ELL (41.5) students was significantly less.

The achievement gap is defined as the observed difference on a number of educational measures between the performance of groups of students, especially groups classified by race/ethnicity, ability, and socioeconomic status. The achievement gap in Iowa can be observed on a variety of measures, including standardized test scores, grade point average, dropout rates, and college-enrollment rates. While most of the data presented in this article comes from Iowa, gaps exist for these groups throughout the United States.

This report examines the dimensions of four distinct gaps found in Iowa public schools including disparities (1) between nonminority and minority students, (2) low socioeconomic and high socioeconomic students, (3) students with disabilities (SD) and those without, and (4) students who are included in English Language Learner (ELL) programs and those who are not. Some gaps have narrowed, some have widened, but for the most part there has been little or no change in the gaps over the last several years. The implications reach beyond the school years. Minority students are less likely to graduate from high school and enter a job market career ready.

These large and persistent gaps have become a focal point of education reform efforts. Research into the causes of gaps in student achievement between low-income, minority students and middle-income, white students have been ongoing since the publication of The Coleman Report (Coleman, 1966). That research suggests that both in-school factors and home/community factors impact the academic achievement of students and contribute to the gap. Efforts to combat the achievement gap have been numerous, but often fragmented. Such efforts have ranged from affirmative action and multicultural education to finance equalization, improving teacher quality, and school testing and accountability programs. Gaps in the life and school experiences of minority group and low-income children mirror the achievement gaps in school as they have for many years (Barton and Coley, 2009). The base causes for the achievement gaps are beyond the scope of this paper, however resources are included for further study.

Historically, the Iowa Department of Education (IDE) has provided professional development (PD) to Area Education Agencies (AEAs) and districts based on evidence-based best practices. The PD has been aimed at powerful instructional strategies that have proven effects for all students, across time and settings. If the strategies are applicable for all students, then differences among student groups should be minimized or eliminated. Unfortunately, the IDE has been remiss in evaluating the long-term effects of the PD on student achievement. And the evidence displayed herein shows that differences among subgroups, and achievement gaps, still exist, and in some cases, are significant. In addition, Iowa's students are becoming more diverse. Higher percentages of students are receiving free or reduced price lunch. More students have individual education plans and are included as students with disabilities. Iowa also has a higher percentage of non-White students than ever before. Thus, it is recommended that conversations be held to identify and address

needs that are specific to different groups of students. This might include academic issues, cultural issues, and school climate and community issues. While solutions might be idiosyncratic to different districts, a design to evaluate the effects of actions taken relative to how those actions affect student outcomes needs to be built a priori. This will enable modifications to local strategies to be based on data, not only based on what is available in the national literature.

Introduction

Sources of Data

Iowa Tests

The Iowa Statewide Testing Program is administered by the College of Education at The University of Iowa. The Iowa Tests of Basic Skills (ITBS) are used in grades K through 8 and the Iowa Tests of Educational Development (ITED) are used in grades 9-12. From its beginning in 1935 with the Iowa Every Pupil Tests, the emphasis in the program has been on the use of results for instructional purposes. Virtually all Iowa school districts, both public and private, have voluntarily participated in this program annually since its inception. The battery of tests includes tests in reading comprehension, mathematics, and science required for Iowa school district's Annual Yearly Progress and Annual Progress Reports. Two of the seven required indicators for student success in Iowa are:

- The percentage of all fourth, eighth, and 11th grade students achieving a proficient or higher reading status on the ITBS or ITED.
- The percentage of all fourth, eighth, and 11th grade students achieving a proficient or higher mathematics status on the ITBS or ITED (Iowa Administrative Code, 12.8(3)).

National Assessment of Educational Progress (NAEP)

NAEP began in 1964 with a grant from the Carnegie Corporation to set up the Exploratory Committee for the Assessment of Progress in Education. The first national assessments were held in 1969. Main NAEP is the name often applied to the most frequently reported NAEP assessments. Main NAEP includes assessments in mathematics, reading, science, writing, the arts, civics, economics, geography, and U.S. history. These assessments follow the frameworks developed by the National Assessment Governing Board, and use the latest advances in assessment methodology. National assessments include all nine subjects above, assessed at grades 4, 8, and 12—although not all grades are assessed each time. Beginning in 1990 four of these subjects (mathematics, reading, science, and writing) are reported also at the state level in grades four and eight, State NAEP. Since 2003, with the implementation of the No Child Left Behind Legislation, all states have participated in the state-level assessments at grades four and eight in reading and mathematics. Iowa participated in many of the voluntary NAEP assessments and all of the mandatory assessments (Table 1). For national assessments, students in public and private schools are assessed, but at the state level, assessment is in public schools only. All comparisons in this paper include only public school students.

Table 1— Iowa Participation in State NAEP

Grade / Year	Mathematics			Reading			Science		Writing	
	4	8	12	4	8	12	4	8	4	8
1990[n]		■								
1992[n]	■	■		■						
1994[n]				■						
1996[n]	■	■						■		
1998				■						
2000	■						■			
2002				■					■	
2003	■	■		■	■					
2005	■	■		■	■					
2007	■	■		■	■					■
2009	■	■	■	■	■	■	■	■		
2011	■	■		■	■			■		
■	Iowa schools participated and received or will receive state level results.									
n	Accommodations were not permitted for this assessment.									

ACT

The ACT is a national college admissions examination that consists of subject area tests in English, mathematics, reading, and science. Since 1959, ACT has collected and reported data on students' academic readiness for college. Because becoming ready for college and career is a process that occurs throughout elementary and secondary education, measuring academic performance over time in the context of college and career readiness provides meaningful information about the college readiness of students. The ACT is a voluntary assessment in Iowa. ACT scores are reported on a 36 point scale.

Project EASIER

Project EASIER (Electronic Access System for Iowa Education Records) is the Iowa Department of Education's comprehensive system of online data. The database includes individual student level data. The project was designed to reduce data burden, encourage better decision-making by establishing and maintaining a cost effective method of accessing and transferring accurate and timely education information among school districts, postsecondary institutions and the Iowa Department of Education.

Understanding Score Gaps

Ways gaps can narrow

Changes in achievement gaps can be the result of changes in the higher performing group, the lower performing group, or both. Gaps can narrow in five different ways, not all of which are desirable. For example, it is possible for the gap to narrow when both the higher and the lower group have scores that decline.
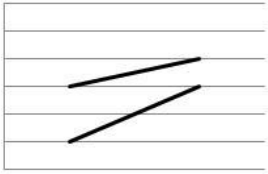
The average scores of both groups increase, while the score of the lower performing group increases even more.
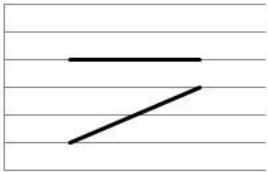
The average score of the higher performing group does not change, while the score of the lower performing group increases.
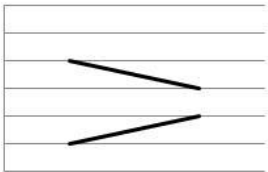
The average score of the higher performing group declines, while the score of the lower performing group increases.

The average score of the higher performing group declines, while the score of the lower performing group does not change.
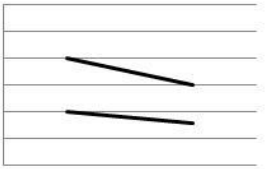
The average scores of both groups decline, but the score of the higher performing group declines even more.

Cautions in Interpreting the Data

Results given here are in terms of scale scores or percent proficient. Many low socioeconomic status students score above the average for higher socioeconomic status students. Similarly, many high socioeconomic status students score below the average for low socioeconomic status students. For additional information on variations in performance including standard deviations consult the following http://www.iowa.gov/educate/ (Iowa Tests), http://nces.ed.gov/nationsreportcard/naepdata/ (NAEP), and http://www.act.org/news/data/10/states.html (ACT).

The analysis of data in this report should not be seen to imply causal relationships. Simple cross tabulations of a variable with measure of educational achievement cannot be considered as evidence that differences in the variable cause differences in educational achievement.

Changes and differences shown in this report are not necessarily significant. In addition, because gap scores are presented as rounded numbers, occasionally the lower score plus the gap will not equal the higher score shown in this report's graphics.

Selected Literature Review

Long Term Problem

Barton and Coley (2010) examined the white-black achievement gap from the beginning of the 20th century. They found gains in achievement for all students born after 1910. During the decade from 1940 through 1990 a decline in the achievement gap was found in both high school and college graduation. Gaps in reading and mathematics performance on the NAEP narrowed from its inception in 1970 through the late 1980s. Since 1990, the NAEP has shown only small changes, up and down, along with periods of stability (Vanneman, et al., 2009).

Correlates of Achievement

In Parsing the Achievement Gap, Barton (2003) completed a review of research on school achievement and indentified 14 correlates of elementary and secondary school achievement. School factors include curriculum rigor, teacher preparation, teacher experience, teacher absence and turnover, class size, availability of instructional technology, and school safety. Eight factors were listed in the before and beyond school factor list. These include mobility, low birth weight, environmental damage (e.g., exposure to lead or mercury), nutrition, talking and reading to babies and young children (Hart and Risley, 1995), excessive television watching, parent-pupil ratio, parent participation at school, and parent availability. Barton found that these factors were correlates with achievement gaps between minority and majority students groups and, except for class size, between students from low income families and high income families. He documents baseline information for tracking progress for each factor.

In 2009, Barton and Coley refined the list to 16 factors identified as being correlated with how well students performed in school. The correlates were divided into three clusters: school factors, home and school connection (parent participation at school), and before and beyond school. Summer achievement gain/loss was added as a factor for both minority and low-SES students (Alexander, Entwisle, and Olson, 2007). Six years after the original article Barton and Cooley see little change in the achievement gap.

Performance in Mathematics and Reading

Socioeconomic Performance Gaps

This section will use the results of the Iowa Tests (ITBS and ITED) and NAEP to examine the socioeconomic status achievement gaps and changes in those gaps in Iowa. Socioeconomic status is determined by eligibility for free or reduced price lunch.

Iowa Tests Socioeconomic Status Results

The percent of Iowa students scoring proficient in grades four and eight has generally increased from the 2001-2003 biennium period. However, the socioeconomic status achievement gap has remained large with students not eligible for free or reduced price lunch performing significantly better on average than students eligible for free or reduced price lunch.

Figure 1 — Results on Iowa Tests by Socioeconomic Status

Reading — Percent of Iowa Grade 4 Students Proficient on ITBS Reading by Socioeconomic Status

Mathematics — Percent of Iowa Grade 4 Students Proficient on ITBS Mathematics by Socioeconomic Status

Percent of Iowa Grade 8 Students Proficient on ITBS Reading by Socioeconomic Status

Percent of Iowa Grade 8 Students Proficient on ITBS Mathematics by Socioeconomic Status
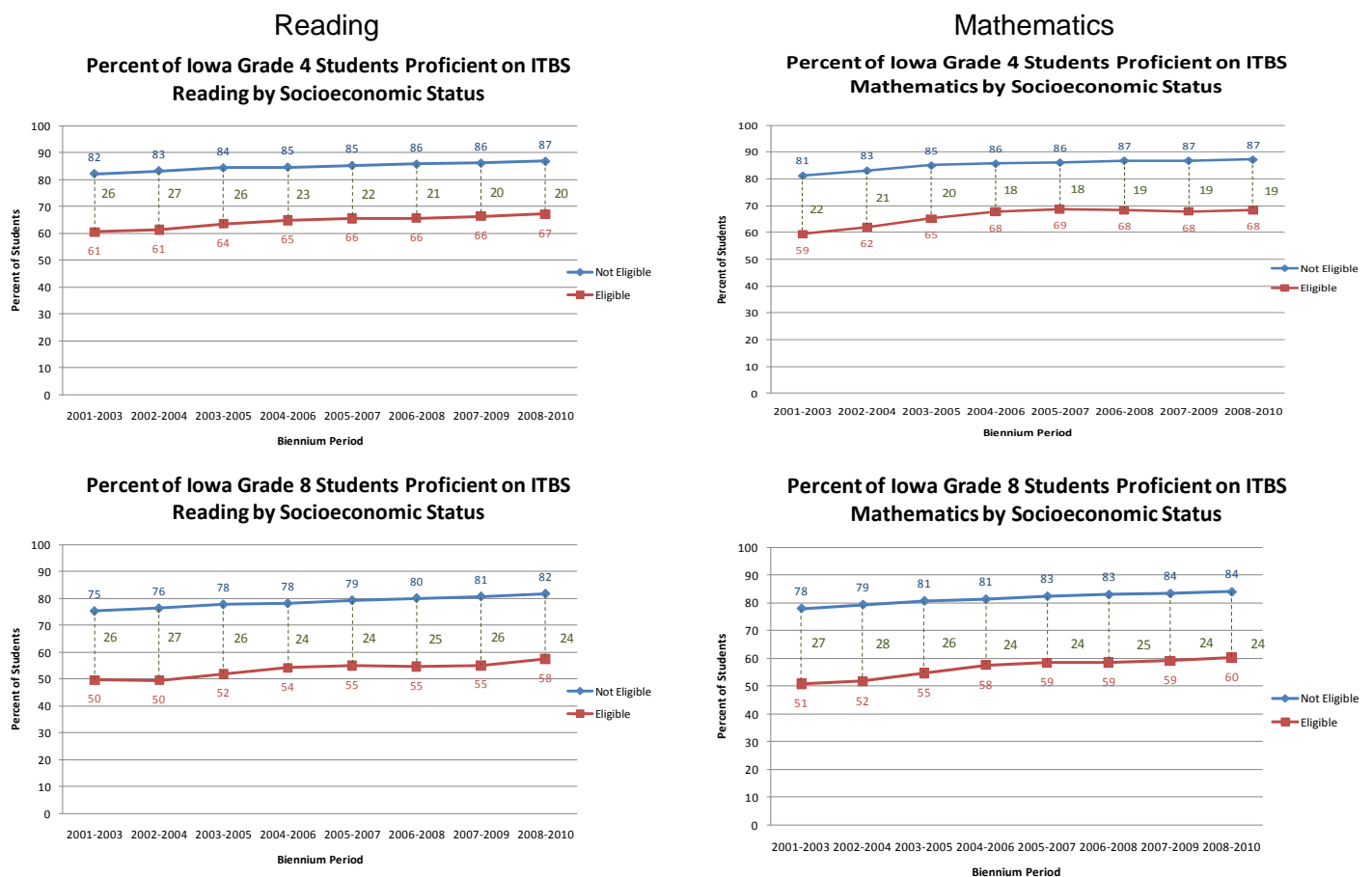
Percent of Iowa Grade 11 Students Proficient on ITED Reading by Socioeconomic Status
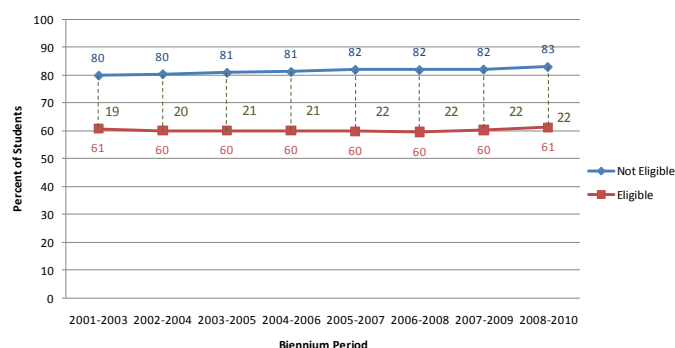
Percent of Iowa Grade 11 Students Proficient on ITED Mathematics by Socioeconomic Status
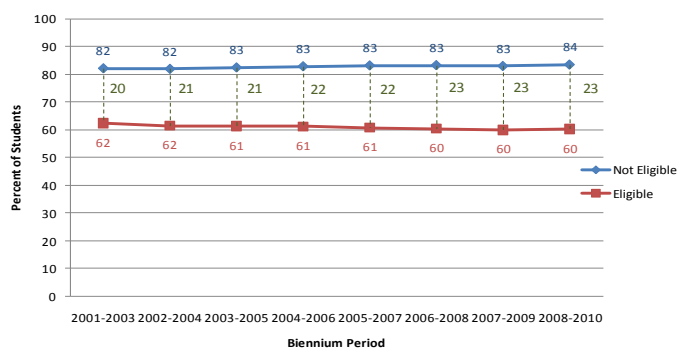
Source: Iowa Testing Programs, The University of Iowa.

Cohort groups were also examined for students in grades six, seven, and eight during the 2009-2010 school year. Higher socioeconomic students performed significantly better on average than low socioeconomic students with no indication of gap closing. Effect sizes (Cohen's d) were calculated and are shown below. The mean effect size for reading was similar to the effect size for mathematics. The effect size in mathematics appears to increase slightly as grade increases.

Table 2 — Reading Effect Sizes for ITBS Socioeconomic Achievement Gaps

Grade in 2010	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Grade 8			-0.66	-0.64	-0.65	-0.65
Grade 7		-0.66	-0.61	-0.65	-0.67	
Grade 6	-0.64	-0.63	-0.67	-0.66		

Table 3 — Mathematics Effect Sizes for ITBS Socioeconomic Achievement Gaps

Grade in 2010	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Grade 8			-0.64	-0.67	-0.69	-0.69
Grade 7		-0.64	-0.64	-0.68	-0.71	
Grade 6	-0.61	-0.63	-0.66	-0.71		

ITBS trend data was examined for students for the last four years using matched cohort groups of students in grades six, seven, and eight during the 2009-2010 school year. Both groups of students, those eligible for free or reduced price lunch and those not eligible for free or reduced price lunch, increased their scores on the ITBS.

Figure 2 — Results on Iowa Tests by Socioeconomic Status, Cohort Trend

Reading

Mathematics

ITBS Reading Grade 6 (2010) Cohort Trend by Subgroup

ITBS Mathematics Grade 6 (2010) Cohort Trend by Subgroup

ITBS Reading Grade 7 (2010) Cohort Trend by Subgroup

ITBS Mathematics Grade 7 (2010) Cohort Trend by Subgroup

ITBS Reading Grade 8 (2010) Cohort Trend by Subgroup

ITBS Mathematics Grade 8 (2010) Cohort Trend by Subgroup
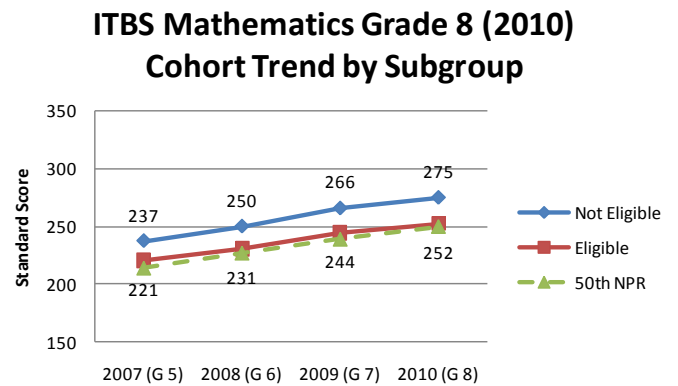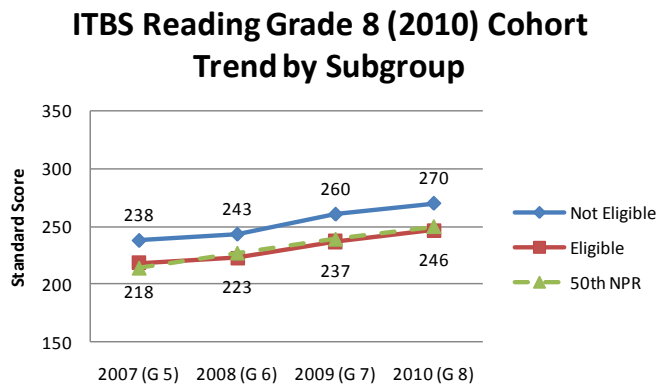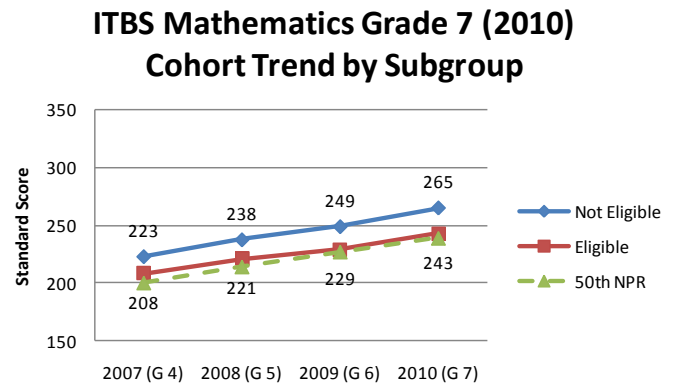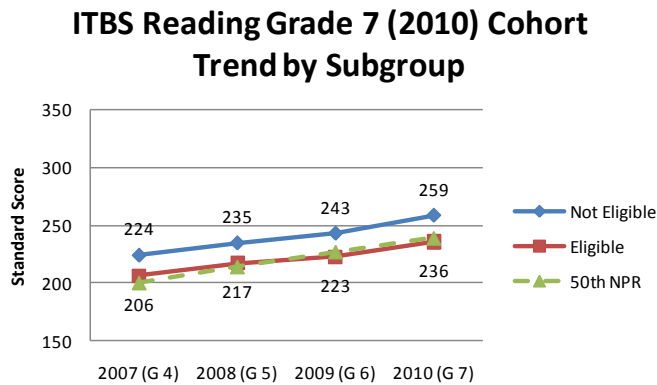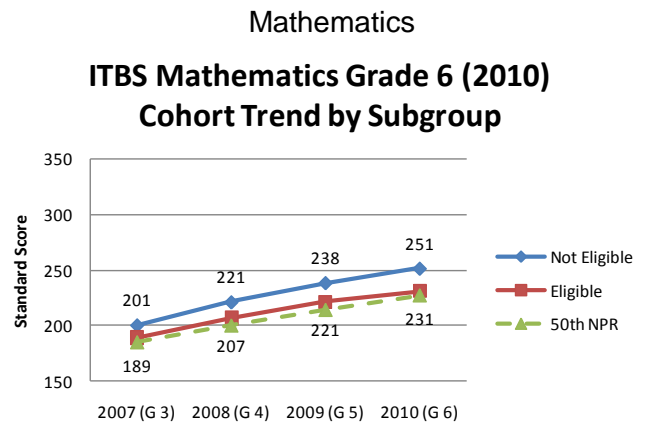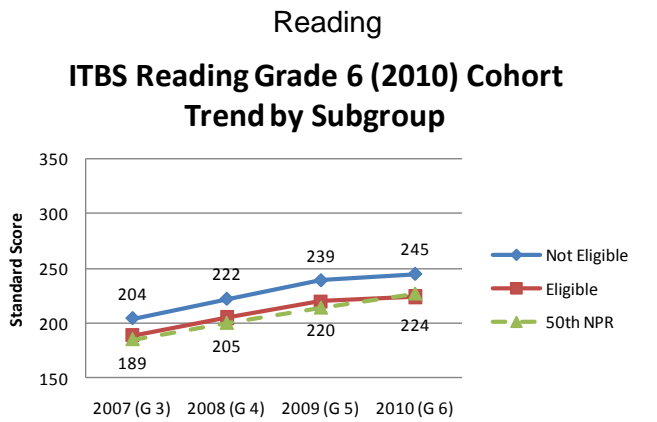
Box plots were constructed for students in grade 8 in 2010 for reading and mathematics by free or reduced price lunch eligibility. Note that many low SES students perform above the higher SES student average and many higher SES students perform below the low SES student average.

Figure 3 — Results on Iowa Tests by Socioeconomic Status, Grade 8
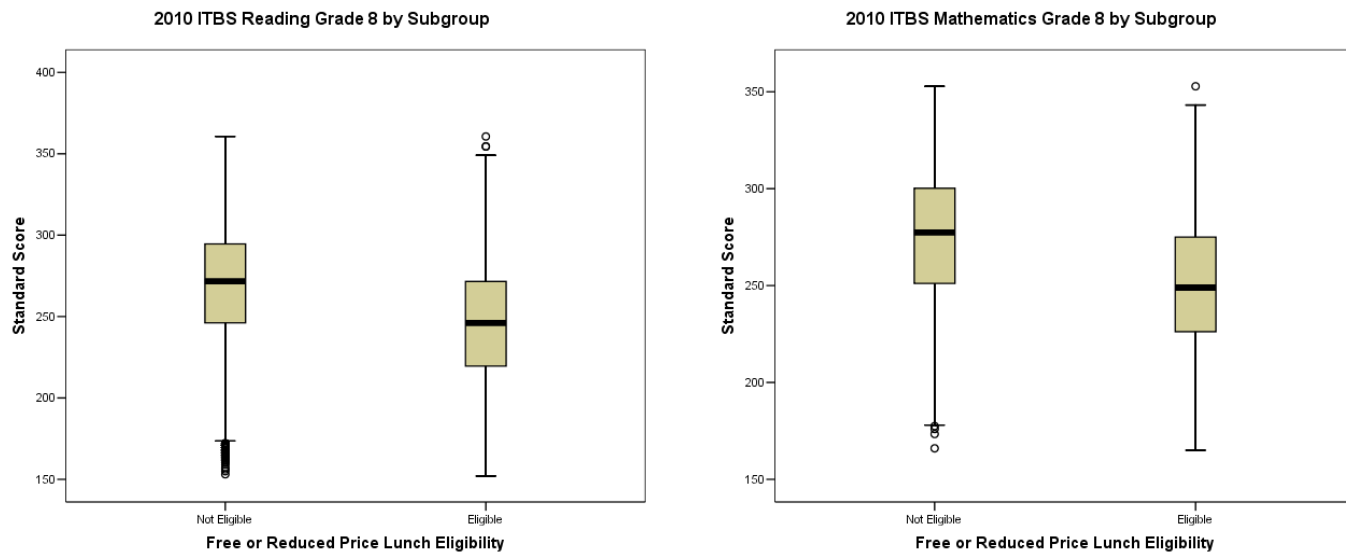
Districts in Iowa were examined for their socioeconomic achievement gaps. The districts represented in the chart below have at least 5 eligible and 5 not eligible eighth grade students.

Figure 4 — Results on Iowa Tests by Socioeconomic Status, District Results
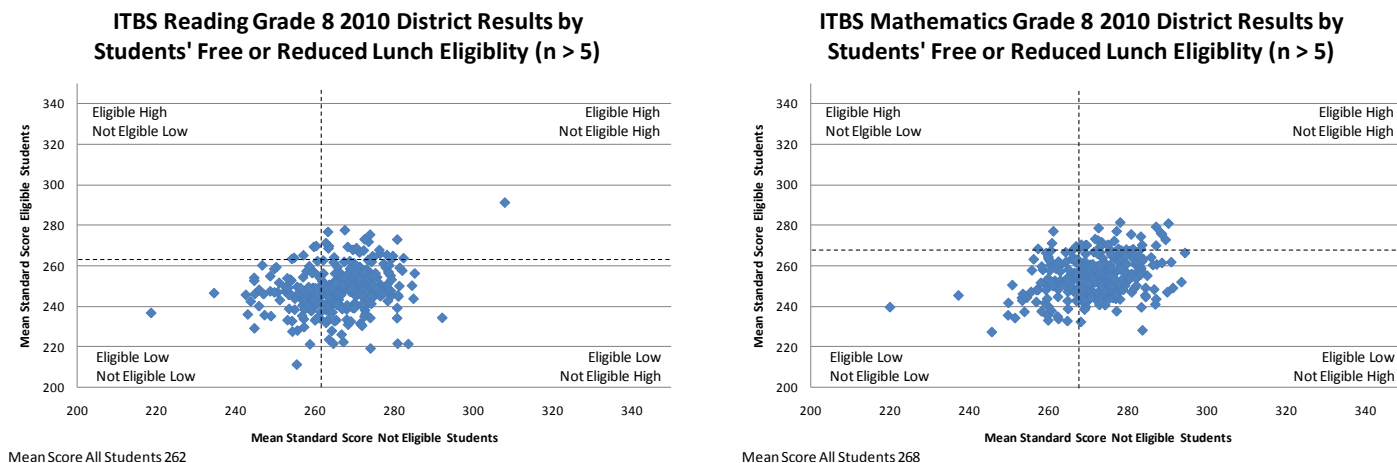
NAEP Socioeconomic Status Results

Since 2003, the NAEP assessment in reading and mathematics is given every odd year to samples of students in grades four and eight in every state. On NAEP, students not eligible for free or reduced price lunch had higher scores than students eligible for free or reduced price, on average, on all assessments. Students not eligible for free or reduced price lunch students had average scores at least 17 points higher than students eligible for free or reduced price in each subject on a 0-500 scale. The average score differences have changed little since state level NAEP assessment were first administered in the early 1990's.

Figure 5 — Results on NAEP by Socioeconomic Status

Reading

NAEP Reading Grade 4
Iowa Non-Eligible FRL - Eligible FRL Gaps
Average reading scale scores and score gaps for Non-Eligible for FRL - Eligible for FRL students, grade 4 Various years, 1996-2009

Non-FRL: 226 (1998), 228 (2002), 230 (2003), 227 (2005), 231 (2007), 229 (2009)
Score Gap: 21, 15, 21, 19, 19, 21
FRL: 205 (1998), 213 (2002), 209 (2003), 208 (2005), 212 (2007), 208 (2009)

*Value is significantly different from the value in 2009.
**Accommodations were not permitted for this assessment.
NOTE: The NAEP Reading scale ranges from 0 to 500. Observed differences are not necessarily statistically significant. Detail may not sum to totals because of rounding. SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1992, 1994, 1998, 2003, 2005, 2007 and 2009 Reading Assessments.

NAEP Reading Grade 8
Iowa Non-Eligible FRL - Eligible FRL Gaps
Average reading scale scores and score gaps for Non-Eligible for FRL - Eligible for FRL students, grade 8 Various years, 2003-2009

Non-FRL: 273 (2003), 272 (2005), 274 (2007), 270 (2009)
Score Gap: 21, 17, 21, 17
FRL: 252 (2003), 255 (2005), 253 (2007), 253 (2009)

*Value is significantly different from the value in 2009.
**Accommodations were not permitted for this assessment.
NOTE: The NAEP Readings scale ranges from 0 to 500. Observed differences are not necessarily statistically significant. Detail may not sum to totals because of rounding. SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003, 2005, 2007 and 2009 Reading Assessments.

Mathematics

NAEP Mathematics Grade 4
Iowa Non-Eligible FRL - Eligible FRL Gaps
Average mathematics scale scores and score gaps for Non-Eligible for FRL - Eligible for FRL students, grade 4 Various years, 1996-2009

Non-FRL: 234 (1996), 235 (2000), 244 (2003), 244 (2005), 249 (2007), 249 (2009)
Score Gap: 15, 13, 17, 13, 18, 17
FRL: 219 (1996), 222 (2000), 227 (2003), 231 (2005), 231 (2007), 232 (2009)

*Value is significantly different from the value in 2009.
**Accommodations were not permitted for this assessment.
NOTE: The NAEP Mathematics scale ranges from 0 to 500. Observed differences are not necessarily statistically significant. Detail may not sum to totals because of rounding. SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996, 2000, 2003, 2005, 2007 and 2009 Mathematics Assessments.

NAEP Mathematics Grade 8
Iowa Non-Eligible FRL - Eligible FRL Gaps
Average mathematics scale scores and score gaps for Non-Eligible for FRL - Eligible for FRL students, grade 8 Various years, 1996-2009

Non-FRL: 287 (1996), 290 (2003), 290 (2005), 292 (2007), 292 (2009)
Score Gap: 15, 24, 21, 22, 23
FRL: 272 (1996), 266 (2003), 269 (2005), 270 (2007), 269 (2009)

*Value is significantly different from the value in 2009.
**Accommodations were not permitted for this assessment.
NOTE: The NAEP Mathematics scale ranges from 0 to 500. Observed differences are not necessarily statistically significant. Detail may not sum to totals because of rounding. SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996, 2000, 2003, 2005, 2007 and 2009 Mathematics Assessments.

Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP).

White and Black Performance Gaps

This section will use the results of the ITBS, ITED, NAEP, and ACT to examine the White-Black achievement gaps and changes in those gaps in Iowa.

Iowa Tests White and Black Results

The percent of Iowa students scoring proficient in grades four and eight has generally increased from the 2001-2003 biennium period. However, the White-Black achievement gap has remained large with White students performing significantly better on average than Black students.

Figure 6 ─ Results on Iowa Tests for White and Black Students
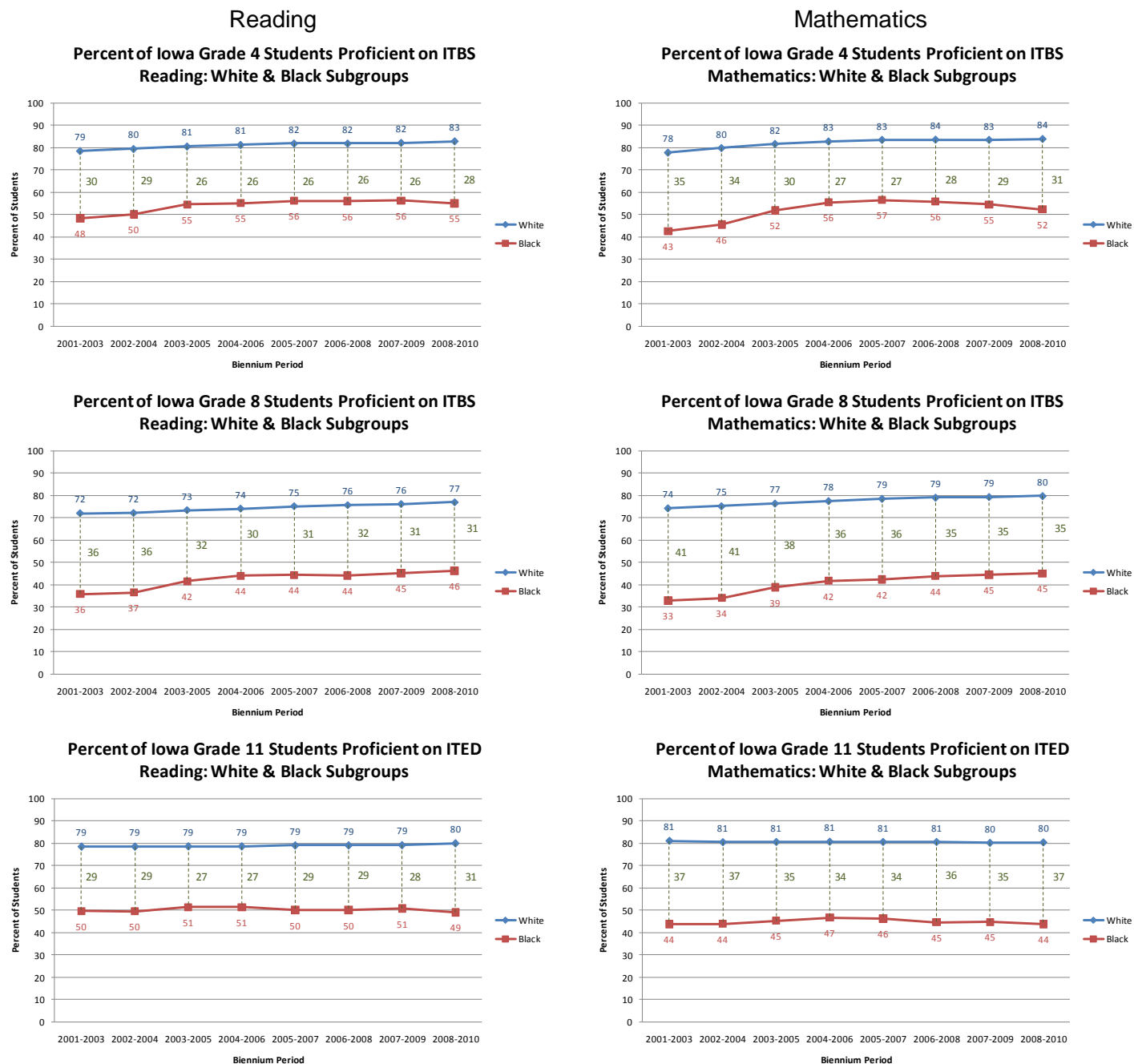
Reading — Mathematics

Source: Iowa Testing Programs, The University of Iowa

Cohort groups were also examined for students in grades six, seven, and eight during the 2009-2010 school year. White students performed significantly better on average than Black students with no indication of gap closing. Effect sizes (Cohen's d) were calculated and are shown below. The mean effect size for reading (0.75) was smaller than for mathematics (0.86).

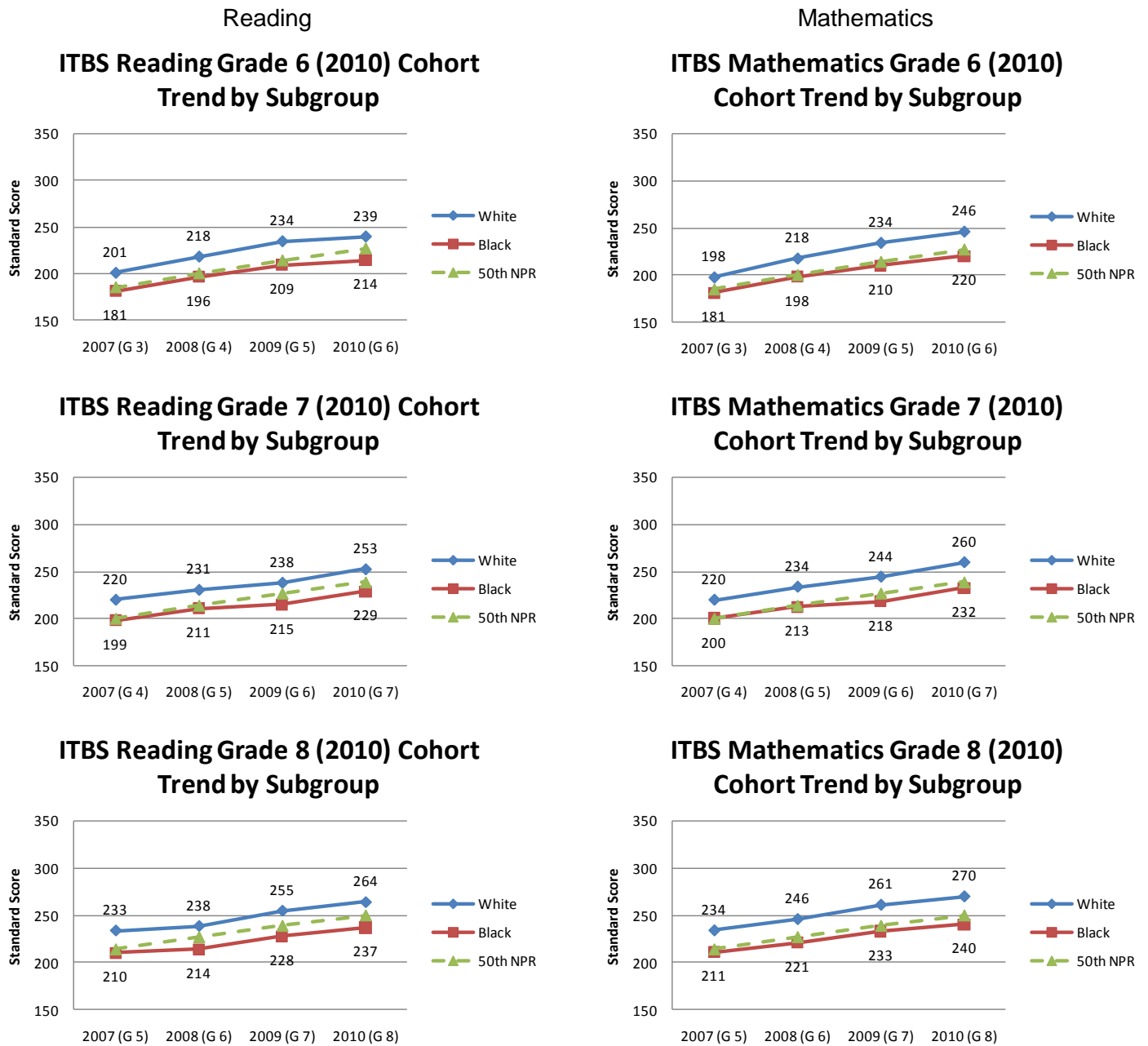Table 4 — Reading Effect Sizes for ITBS White-Black Achievement Gaps

Grade in 2010	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Grade 8			-0.77	-0.74	-0.74	-0.75
Grade 7		-0.77	-0.67	-0.72	-0.67	
Grade 6	-0.78	-0.77	-0.85	-0.77		

Table 5 — Mathematics Effect Sizes for ITBS White-Black Achievement Gaps

| Grade in 2010	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Grade 8			-0.86	-0.84	-0.87	-0.88
Grade 7		-0.83	-0.79	-0.88	-0.84	
Grade 6	-0.87	-0.84	-0.90	-0.88		

ITBS trend data was examined for White and-Black students for the last four years using matched cohort groups of students in grades six, seven, and eight during the 2009-2010 school year. While both groups of students increased their scores on the ITBS, Black students appear to fall below the 50 national percentile rank at the end of the four year period for each grade in reading and mathematics.

Figure 7 — Results on Iowa Tests for White and Black Students, Cohort Trends

Reading

ITBS Reading Grade 6 (2010) Cohort Trend by Subgroup

ITBS Reading Grade 7 (2010) Cohort Trend by Subgroup

ITBS Reading Grade 8 (2010) Cohort Trend by Subgroup

Mathematics

ITBS Mathematics Grade 6 (2010) Cohort Trend by Subgroup

ITBS Mathematics Grade 7 (2010) Cohort Trend by Subgroup

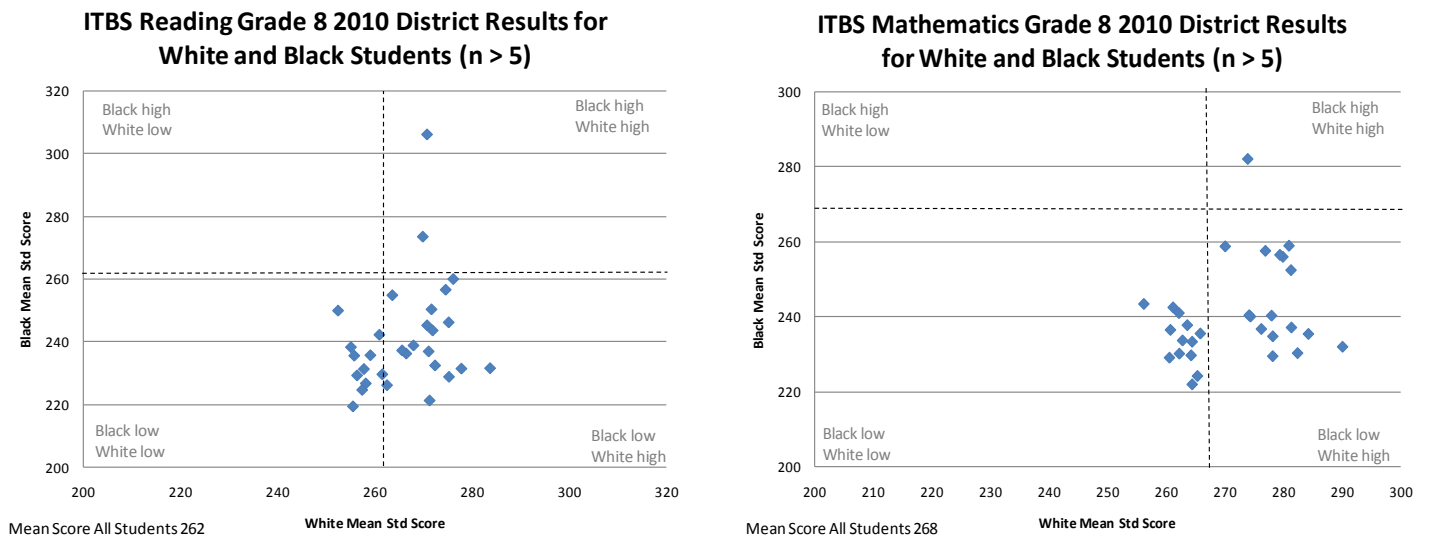**ITBS Mathematics Grade 8 (2010) Cohort Trend by Subgroup**

Box plots were constructed for White and Black students in grade eight in 2010 for reading and mathematics. Note that some Black students perform above the White student average and some White students perform below the Black student average.

Figure 8 ─ Results on Iowa Tests for White and Black Students, Grade 8

2010 ITBS Reading Grade 8 by Subgroup

2010 ITBS Mathematics Grade 8 by Subgroup
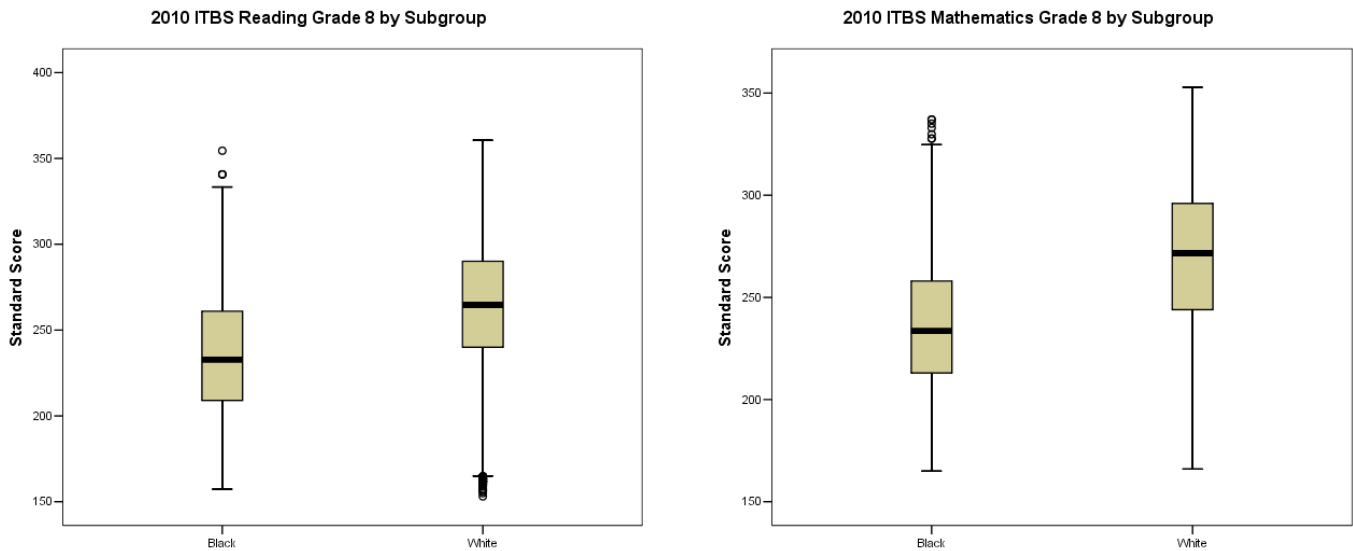
Districts in Iowa were examined for their White-Black achievement gaps. The districts represented in the chart below have at least five Black and five White students at the grade level shown.
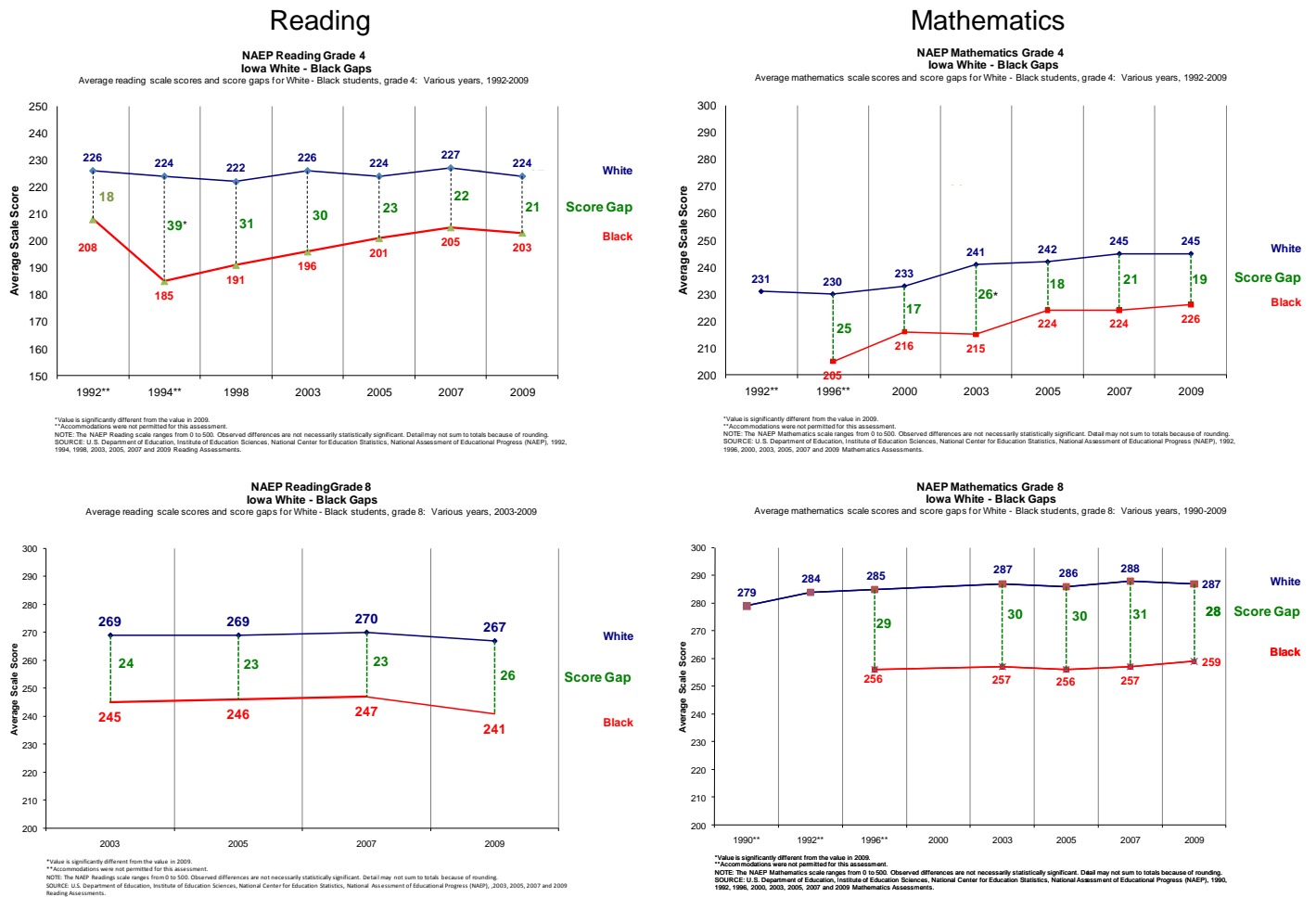
Figure 9 ─ Results on Iowa Tests for White and Black Students, District Results

ITBS Reading Grade 8 2010 District Results for White and Black Students (n > 5)

Mean Score All Students 262

ITBS Mathematics Grade 8 2010 District Results for White and Black Students (n > 5)

Mean Score All Students 268

NAEP White and Black Results

Since 2003, the NAEP assessment in reading and mathematics is given every odd year to samples of students in grades four and eight in every state. On NAEP, White students had higher scores than Black students, on average, on all assessments. White students had average scores at least 19 points higher than Black students in each subject on a 0-500 scale. The average score differences have changed little since state level NAEP assessments were first administered in the early 1990's.

13
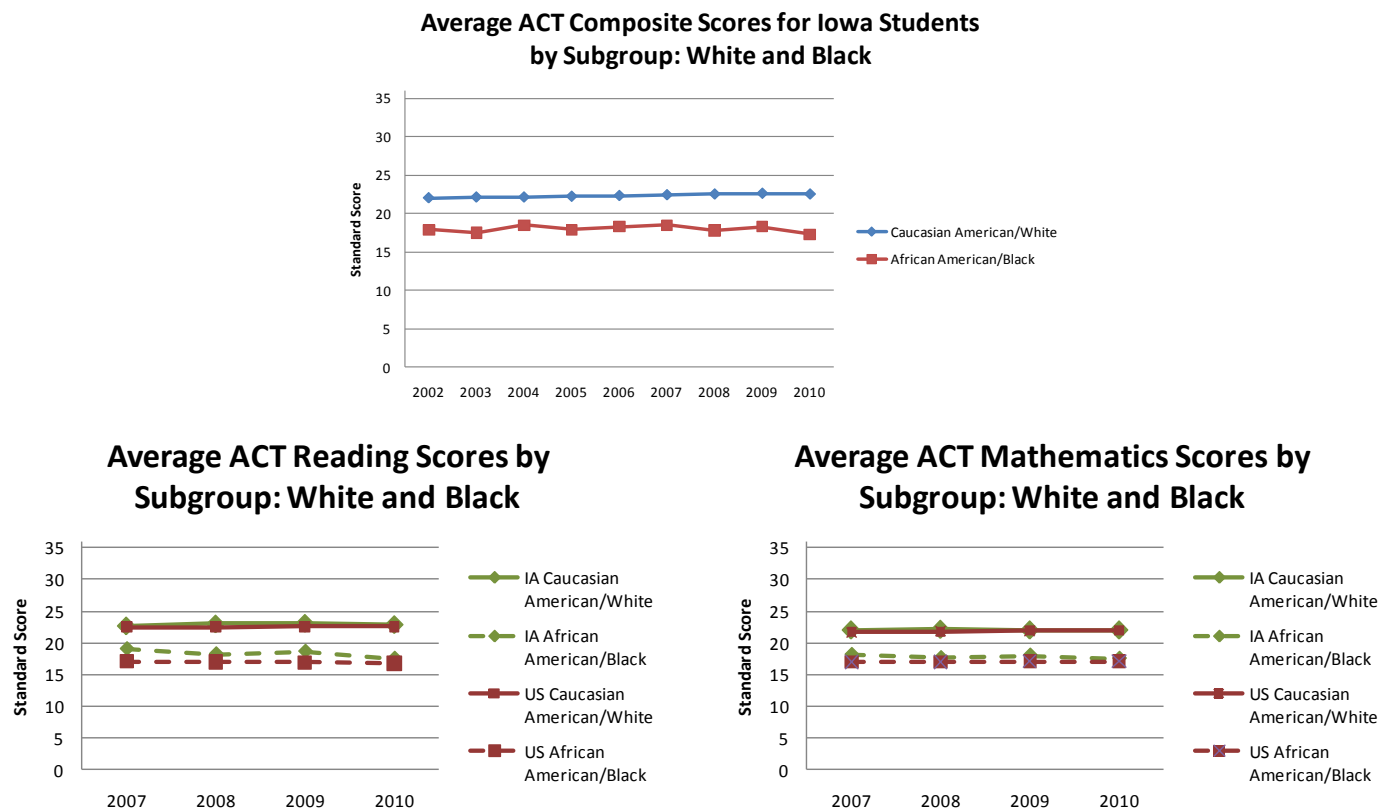
Figure 10 — Results on NAEP for White and Black Students

Reading

NAEP Reading Grade 4
Iowa White - Black Gaps
Average reading scale scores and score gaps for White - Black students, grade 4: Various years, 1992-2009

*Value is significantly different from the value in 2009.
**Accommodations were not permitted for this assessment.
NOTE: The NAEP Reading scale ranges from 0 to 500. Observed differences are not necessarily statistically significant. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1992, 1994, 1998, 2003, 2005, 2007 and 2009 Reading Assessments.

NAEP Reading Grade 8
Iowa White - Black Gaps
Average reading scale scores and score gaps for White - Black students, grade 8: Various years, 2003-2009

*Value is significantly different from the value in 2009.
**Accommodations were not permitted for this assessment.
NOTE: The NAEP Readings scale ranges from 0 to 500. Observed differences are not necessarily statistically significant. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), ,2003, 2005, 2007 and 2009 Reading Assessments.

Mathematics

NAEP Mathematics Grade 4
Iowa White - Black Gaps
Average mathematics scale scores and score gaps for White - Black students, grade 4: Various years, 1992-2009

*Value is significantly different from the value in 2009.
**Accommodations were not permitted for this assessment.
NOTE: The NAEP Mathematics scale ranges from 0 to 500. Observed differences are not necessarily statistically significant. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1992, 1996, 2000, 2003, 2005, 2007 and 2009 Mathematics Assessments.

NAEP Mathematics Grade 8
Iowa White - Black Gaps
Average mathematics scale scores and score gaps for White - Black students, grade 8: Various years, 1990-2009

*Value is significantly different from the value in 2009.
**Accommodations were not permitted for this assessment.
NOTE: The NAEP Mathematics scale ranges from 0 to 500. Observed differences are not necessarily statistically significant. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1990, 1992, 1996, 2000, 2003, 2005, 2007 and 2009 Mathematics Assessments.

Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP).

ACT White and Black Results

The ACT is a curriculum-based measure of college readiness. ACT components include tests of academic achievement in English, math, reading, science, and writing (optional). White students had average scores at least 4.5 points higher than Black students in each subject on a 36 point scale. The number of Black students taking the ACT has increased slightly in recent years, but still remains proportionally low when compared to the population. Five hundred eighty-three Black students (2.5% of all students assessed) in the graduating class of 2010 completed the ACT compared to 19,967 White students (87.0%).

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Figure 11 — Results on ACT for White and Black Students

**Average ACT Composite Scores for Iowa Students
by Subgroup: White and Black**

Legend:
- Caucasian American/White
- African American/Black

**Average ACT Reading Scores by
Subgroup: White and Black**

Legend:
- IA Caucasian American/White
- IA African American/Black
- US Caucasian American/White
- US African American/Black

**Average ACT Mathematics Scores by
Subgroup: White and Black**

Legend:
- IA Caucasian American/White
- IA African American/Black
- US Caucasian American/White
- US African American/Black

Source: ACT Profile Reports, Iowa.

White and Hispanic Performance Gaps

This section will use the results of the ITBS, ITED, NAEP, and ACT to examine the Hispanic-White achievement gaps and changes in those gaps in Iowa.

Iowa Tests White and Hispanic Results

The percent of Iowa students scoring proficient in grades four and eight has generally increased from the 2001-2003 biennium period. While the gap has narrowed slightly, the White-Hispanic achievement gap remains large with White students performing significantly better on average than Hispanic students.

Figure 12 ─ Results on Iowa Tests for White and Hispanic Students
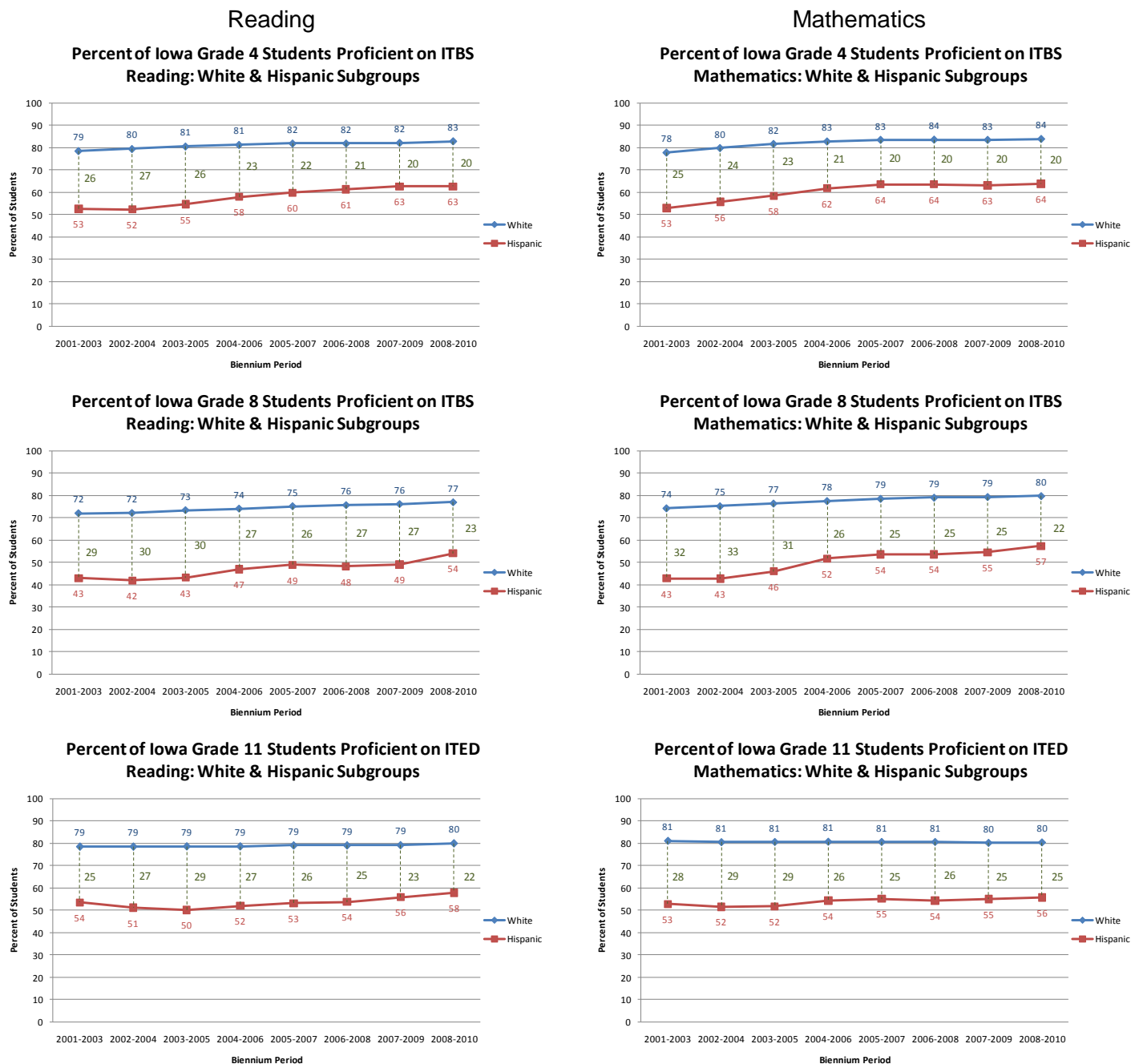
Reading | Mathematics

Source: Iowa Testing Programs, The University of Iowa.

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Cohort groups were also examined for students in grades six, seven, and eight during the 2009-2010 school year. White students performed significantly better on average than Hispanic students with slight indication of gap closing. Effect sizes (Cohen's d) were calculated and are shown below. The mean effect size for reading (0.75) was smaller than for mathematics (0.86).

Table 6 — Reading Effect Sizes for ITBS White-Hispanic Achievement Gaps

Grade in 2010	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Grade 8			-0.60	-0.51	-0.57	-0.50
Grade 7		-0.60	-0.55	-0.57	-0.48	
Grade 6	-0.60	-0.60	-0.60	-0.50		

Table 7 — Mathematics Effect Sizes for ITBS White-Hispanic Achievement Gaps

Grade in 2010	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Grade 8			-0.62	-0.60	-0.58	-0.57
Grade 7		-0.60	-0.54	-0.59	-0.56	
Grade 6	-0.57	-0.58	-0.61	-0.57		

ITBS trend data was examined for White and Hispanic students for the last four years using matched cohort groups of students in grades six, seven, and eight during the 2009-2010 school year. While both groups of students increased their scores on the ITBS, Hispanic students continue to score significantly below the white students at each grade in reading and mathematics with no evidence of gap closure.

Figure 13 — Results on Iowa Tests for White and Hispanic Students, Cohort Trends

Reading

Mathematics

ITBS Reading Grade 6 (2010) Cohort Trend by Subgroup

ITBS Mathematics Grade 6 (2010) Cohort Trend by Subgroup

ITBS Reading Grade 7 (2010) Cohort Trend by Subgroup

ITBS Mathematics Grade 7 (2010) Cohort Trend by Subgroup

ITBS Reading Grade 8 (2010) Cohort Trend by Subgroup

ITBS Mathematics Grade 8 (2010) Cohort Trend by Subgroup
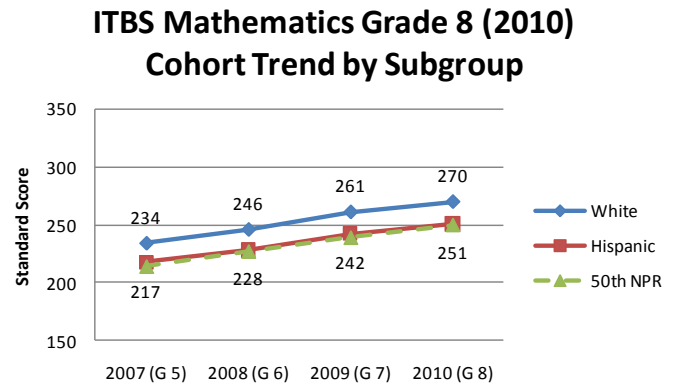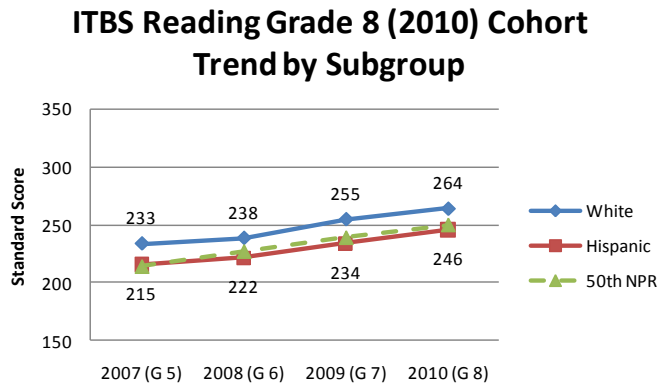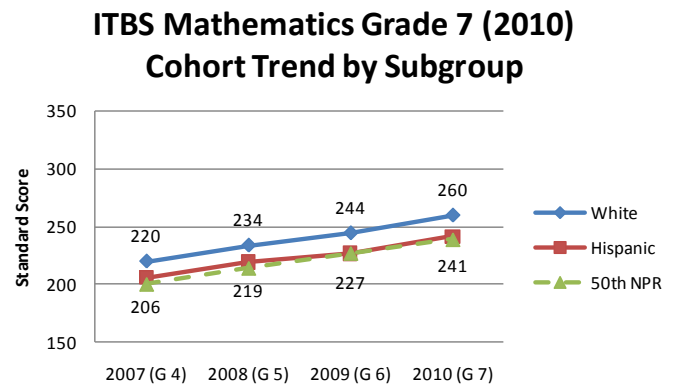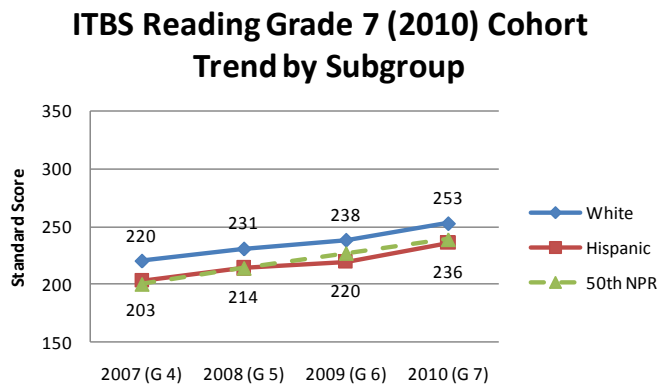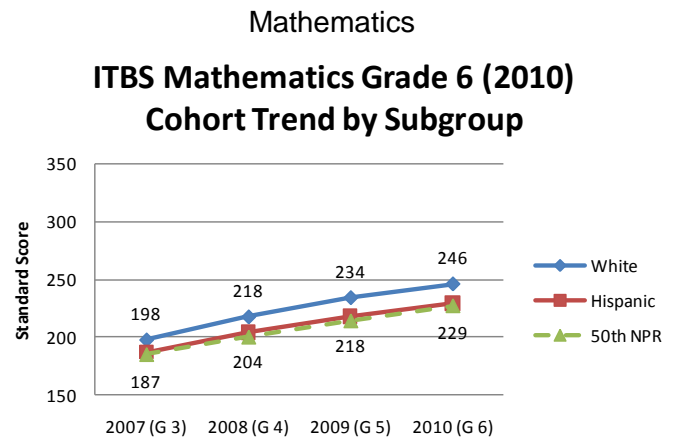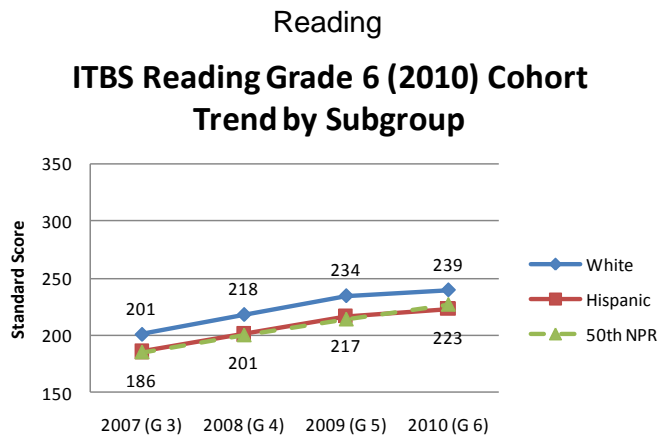
Box plots were constructed for grade 8 White and Hispanic students in grade 8 in 2010 for reading and mathematics. Note that many Hispanic students perform above the White student average and many White students perform below the Hispanic student average.

Figure 14 — Results on Iowa Tests for White and Hispanic Students, Grade 8
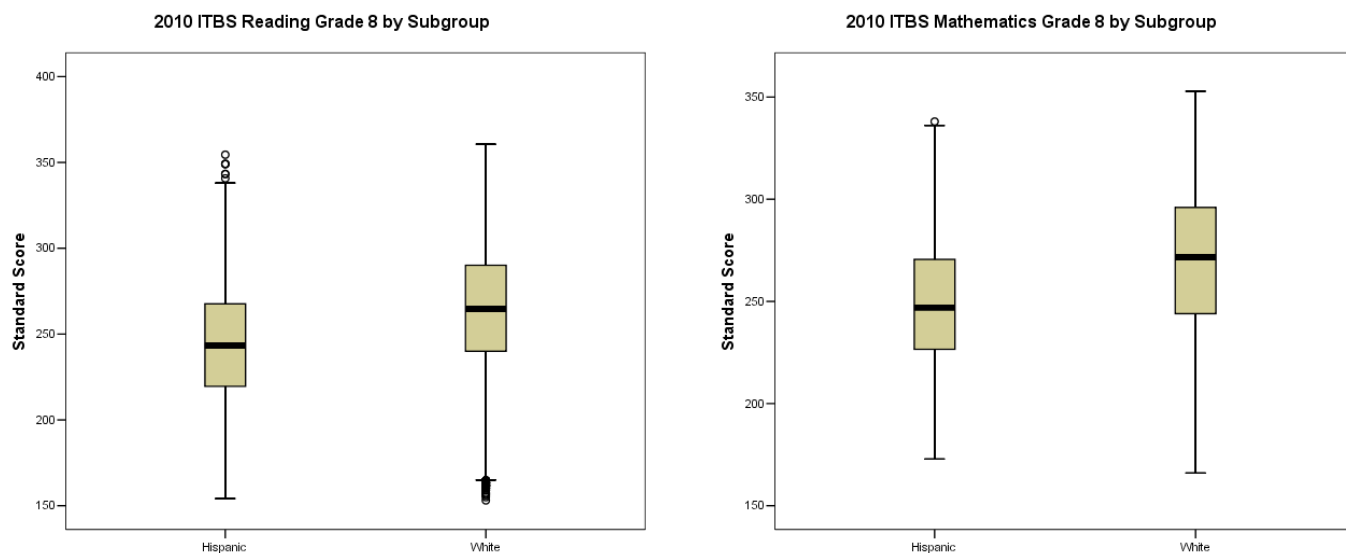
Districts in Iowa were examined for their White - Hispanic achievement gaps. The districts represented in the chart below have at least 5 Hispanic and 5 White students at the grade level shown.

Figure 15 — Results on Iowa Tests for White and Hispanic Students, District Results
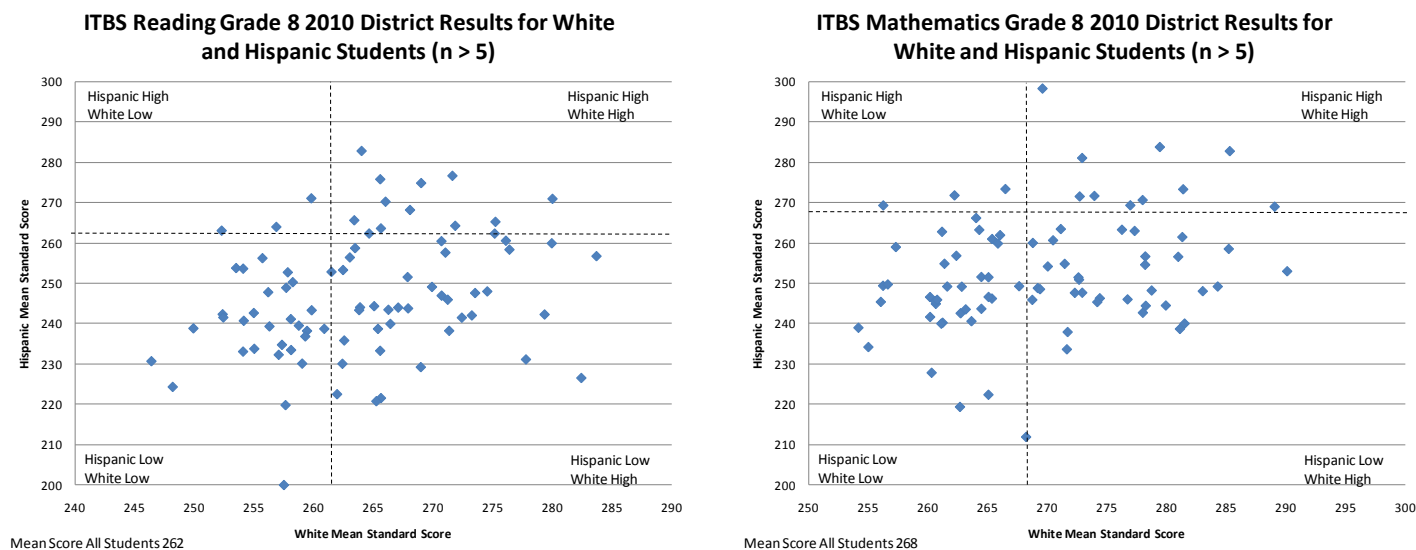
NAEP White and Hispanic Results

Since 2003, the NAEP assessment in reading and mathematics is given every odd year to samples of students in grades four and eight in every state. On NAEP, White students had higher scores than Hispanic students, on average, on all assessments. White students had average scores at least 17 points higher than Hispanic students in each subject on a 0-500 scale. The average score differences have changed little since state level NAEP assessments were first administered in the early 1990's.

Figure 16 — Results on NAEP for White and Hispanic Students

Reading

NAEP Reading Grade 4
Iowa White - Hispanic Gaps
Average reading scale scores and score gaps for White - Hispanic students, grade 4: Various years, 1992-2009

*Value is significantly different from the value in 2009.
**Accommodations were not permitted for this assessment.
NOTE: The NAEP Reading scale ranges from 0 to 500. Observed differences are not necessarily statistically significant. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1992, 1994, 1998, 2003, 2005, 2007 and 2009 Reading Assessments.

NAEP Reading Grade 8
Iowa White - Hispanic Gaps
Average reading scale scores and score gaps for White - Hispanic students, grade 8: Various years, 2003-2009

*Value is significantly different from the value in 2009.
**Accommodations were not permitted for this assessment.
NOTE: The NAEP Readings scale ranges from 0 to 500. Observed differences are not necessarily statistically significant. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003, 2005, 2007 and 2009 Reading Assessments.

Mathematics

NAEP Mathematics Grade 4
Iowa White - Hispanic Gaps
Average mathematics scale scores and score gaps for White - Hispanic students, grade 4: Various years, 1992-2009

*Value is significantly different from the value in 2009.
**Accommodations were not permitted for this assessment.
NOTE: The NAEP Mathematics scale ranges from 0 to 500. Observed differences are not necessarily statistically significant. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1992, 1996, 2000, 2003, 2005, 2007 and 2009 Mathematics Assessments.

NAEP Mathematics Grade 8
Iowa White - Hispanic Gaps
Average mathematics scale scores and score gaps for White - Hispanic students, grade 8: Various years, 1990-2009

*Value is significantly different from the value in 2009.
**Accommodations were not permitted for this assessment.
NOTE: The NAEP Mathematics scale ranges from 0 to 500. Observed differences are not necessarily statistically significant. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1990, 1992, 1996, 2000, 2003, 2005, 2007 and 2009 Mathematics Assessments.

Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP).

ACT White and Hispanic Results

On the ACT, White students had average scores 3.3 points higher than Hispanic students in each subject on a 36 point scale. The number of Hispanic students taking the ACT has increased slightly in recent years, but still remains proportionally low when compared to the population. Seven hundred Hispanic students (3.5% of all students assessed) in the graduating class of 2010 completed the ACT compared to 19,967 White students (87.0%). This was an increase from 2009 (556 Hispanic students).

Figure 17 — Results on ACT for White and Hispanic Students

Average ACT Composite Scores for Iowa Students by Subgroup: White and Hispanic

Average ACT Reading Scores by Subgroup: White and Hispanic

Average ACT Mathematics Scores by Subgroup: White and Hispanic
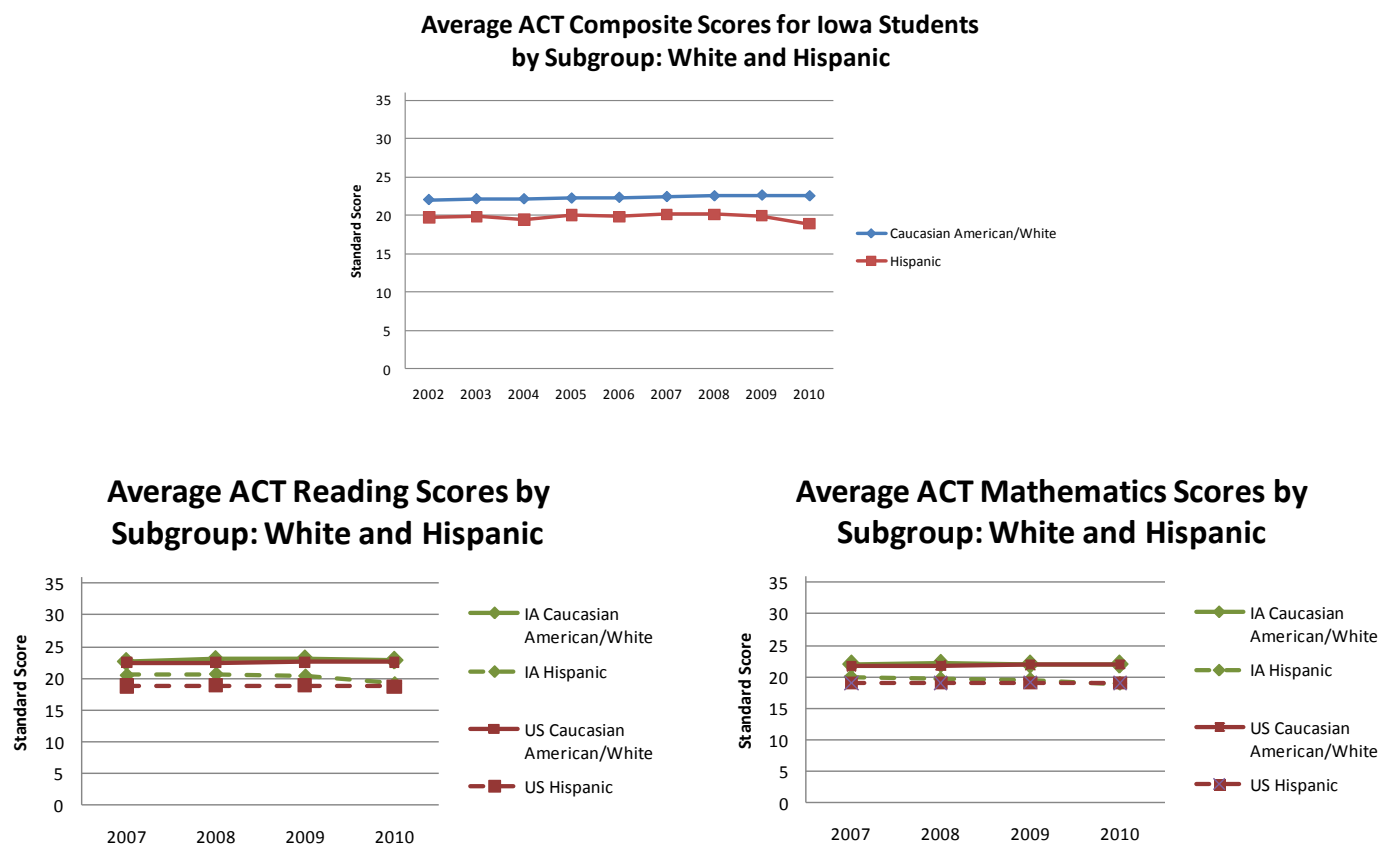
Source: ACT Profile Reports, Iowa.

Students with Disabilities and English Language Learners Performance Gaps

The purpose of this analysis was to identify the observed magnitude of group differences in academic achievement. Groups that were compared and contrasted include students based on race, socio-economic status (free/reduced lunch, FRL), disability (IEP) status and language proficiency (ELL) status. Whereas a traditional analysis for No Child Left Behind – Adequate Yearly Progress examines students in these subgroups independently, the current analysis combined these subgroups for a more detailed look at student achievement. An initial analysis compared students based on a combination of race, FRL, and disability status followed by analyses of students based on a combination of race, FRL, disability, and English Language Learner status.

The context of education in Iowa is such that there is a drastically uneven distribution of students of color across the state. Using the AYP grades for this analysis (grades 3-8, 11), these results are based on the distribution of students who were enrolled for a Full Academic Year. The numbers represent the number of districts that fall within each group regarding the number of students of each group. 215 Districts had fewer than 20 non-white students in seven grades, and 138 Districts had fewer than 10 non-white students in seven grades. Only 146 districts, 40.4% had more than 20 non-white students in grades three through eight and eleven (Table 8). Thus, while the data for all students and white students represents all districts in the state, the data for race groups only represent those districts having non-white students. These data represent our FAY dataset used for AYP decisions.

Table 8 ─ Number of Districts by Group Size

Group Size	Asian	Black	Hispanic	Native American	Multi-Racial	Hawaiian or Pacific Islander	White	Minority
> 1000	0	4	2	0	0	0	35	6
> 500	1	5	5	0	1	0	94	13
> 100	10	16	28	1	6	0	327	46
> 50	20	26	47	3	16	0	346	82
> 20	31	38	97	8	33	2	359	146

The two subgroups with the fewest students statewide are the Hawaiian/Pacific Islander group and the Native American group. Thus, while results are displayed for groups with ten or more students, results should be interpreted with caution, since some n-count totals are very small.

In most cases, the highest performing race group was Asian, followed by White, and the lowest performing group was Black, and in some instances, Hispanic. These results tend to be observed across IEP, FRL, or ELL status. The tables also display gaps based on IEP or FRL status.

Group Differences in Academic Achievement: Current Status

Student achievement results for the 2009-2010 school year, using the ITBS and ITED, were examined to determine to the extent to which subgroups differed regarding the percent of students achieving proficiency. Several gaps among subgroups exist, and should elicit conversation about causes and how to address them.

The purpose of this analysis was to identify and quantify differences among various subgroups of students, disaggregated by several variables. NCLB requires disaggregation of students by a single variable. The current analysis studied differences based on combinations of variables. Conversations about achievement gaps have tended to reflect gaps that have been found in large scale research. We know that differences exist between poor and not-poor, between students with and without disabilities, and between racial groups. This study presents the current status of students in Iowa, brings the issues 'closer to home', enabling conversations about digging deeper into the data, and what to do about it.

Design/Methods

Data were results from the Iowa Tests of Basic Skills (ITBS) and the Iowa Tests of Educational Development (ITED), for the 2009-2010 school year, administered by school districts as a part of requirements of the No Child Left Behind Act of 2001 (NCLB). Only students enrolled in a district for a full academic year (FAY) were used in the analysis. Students participating in the Iowa Alternate Assessment were not included, to be able to interpret achievement using the same metric. For this analysis, results for students in grades three through eight and eleven were used. These are the grades that are used for making determinations on Adequate Yearly Progress (AYP). Data were aggregated as an initial level analysis, from which analyses could be conducted by level (elementary, middle, high), grade, and for districts or schools.

Variables used in the analyses were socioeconomic status, i.e., students receiving free or reduced lunch (FRL), students who did not receive free or reduced lunch (NFRL), students with disabilities (IEP), non-disabled students (NIEP), students who were English language learners (ELL), and English speaking students (NELL). Combinations of these variables were also combined and displayed by race codes, all students (students of all races combined), Asian (a), Black (b), Hispanic (h), Native American (i), Hawaiian or other pacific islander (p), white (w), and multi-racial (m; two or more races). Analyses distinguished the percent of proficient students in reading and mathematics for each of these groups, and gaps among the groups were analyzed.

Results

The following pages show the twelve tables that are included in this analysis (six for reading; six for mathematics). The two main tables for reading and mathematics are each disaggregated by SES and disability status. The remaining four tables display ELL by SES, ELL by IEP, Non-ELL by SES, and Non-ELL by IEP. All charts contain race breakouts. Because the tables were created in pairs, one table in each pair contains the number of students in each disaggregated group. The groups with fewer than ten students are suppressed. Generally, the assumptions about the nature of student achievement were confirmed, although results uncovered some interesting disparities.

Summary and Implications

These data are simply an initial step in bringing the achievement gap data 'closer to home'. No longer are we able to ignore the fact that what is happening in other states is also happening in our own backyard. It is hoped that conversations can begin at state, regional, and local levels to conduct investigations into the causes of, and strategies to eliminate, achievement gaps among Iowa's children.

In the following, overall, non-FRL is performing at higher proficiency rates than FRL in all groups for Non-IEP students. White and Multi FRL IEP performed higher than Black NFRL IEP. Non IEP is doing better than IEP overall. The gap is widest for Pacific non-IEP students based on FRL/NFRL. The gap is narrowest for Multi IEP students based on FRL/NFRL.

Figure 18 ─ SES differences by Race and Disability - Reading
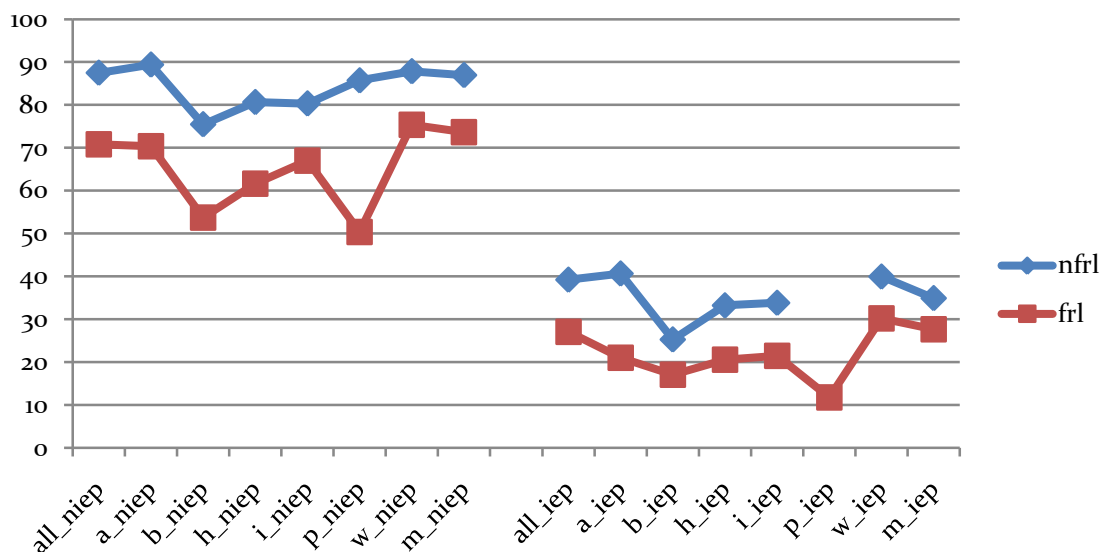
Table 9 ─ SES differences by Race and Disability – Reading

Highest Achievement – NIEP NFRL	Asian – 89.39
Lowest Achievement – NIEP NFRL	Native American – 80.33
Difference	9.06% Proficient
Highest Achievement – NIEP FRL	White – 75.36
Lowest Achievement – NIEP FRL	Pacific – 50.39
Difference	24.97% Proficient
Highest Achievement – IEP NFRL	Asian – 40.68
Lowest Achievement – IEP NFRL	Black – 25.31
Difference	15.37% Proficient
Highest Achievement – IEP FRL	White – 30.21
Lowest Achievement – IEP FRL	Pacific – 11.76
Difference	18.45% Proficient
Greatest Gap – NIEP (NFRL - FRL)	Pacific – 35.32
Smallest Gap – NIEP (NFRL - FRL)	White – 12.48
Greatest Gap – IEP (NFRL - FRL)	Asian – 19.67
Smallest Gap – IEP (NFRL - FRL)	Multi – 7.29

Overall, Non IEP is doing better than IEP overall. The gap is widest for Multi non-FRL students based on IEP status. The gap is narrower for FRL students than NFRL students based on IEP status.

Figure 19 ─ Disability differences by Race and SES - Reading
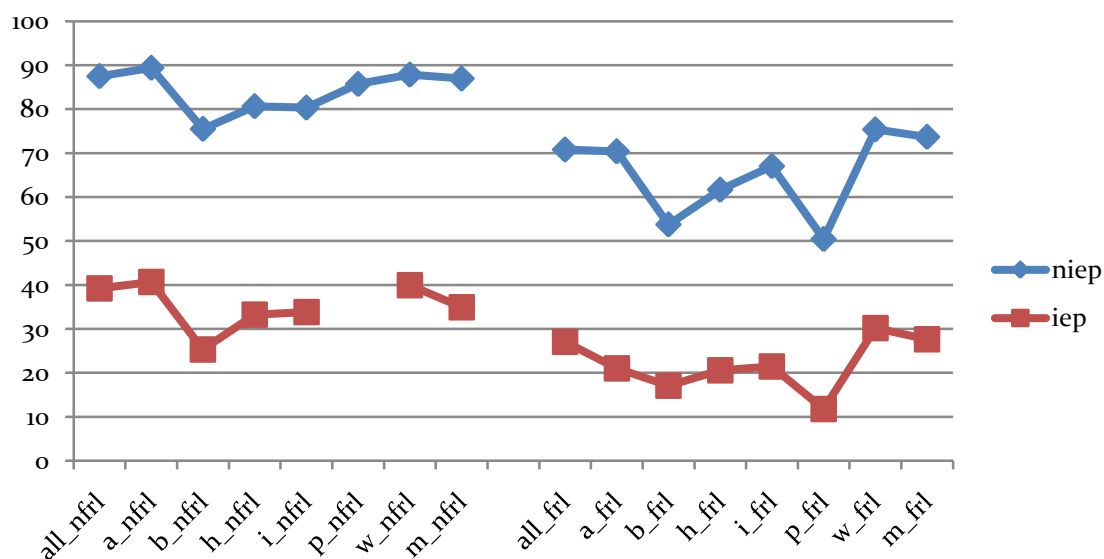
Table 10 ─ Disability differences by Race and SES – Reading

Highest Achievement – NFRL NIEP	Asian – 89.39
Lowest Achievement – NFRL NIEP	Native American – 80.33
Difference	9.06% Proficient
Highest Achievement – NFRL IEP	Asian – 40.68
Lowest Achievement – NFRL IEP	Black – 25.31
Difference	15.37% Proficient
Highest Achievement – FRL NIEP	White – 75.36
Lowest Achievement – FRL NIEP	Pacific – 50.39
Difference	24.97% Proficient
Highest Achievement – FRL IEP	White – 30.21
Lowest Achievement – FRL IEP	Pacific – 11.76
Difference	18.45% Proficient
Greatest Gap – NFRL (NIEP - IEP)	Multi – 52.00
Smallest Gap – NFRL (NIEP - IEP)	Native American – 46.48
Greatest Gap – FRL (NIEP - IEP)	Asian – 49.37
Smallest Gap – FRL (NIEP - IEP)	Black – 36.68

In the following, several groups are not represented, because there were few or no students in the subgroups. Still, NFRL is doing better than FRL, although the gaps are smaller in most instances. ELL students within NFRL IEP group perform nearly as well as Black and Pacific non-IEP students on FRL.

Figure 20 ─ SES differences by Race and Disability for English Language Learners - Reading
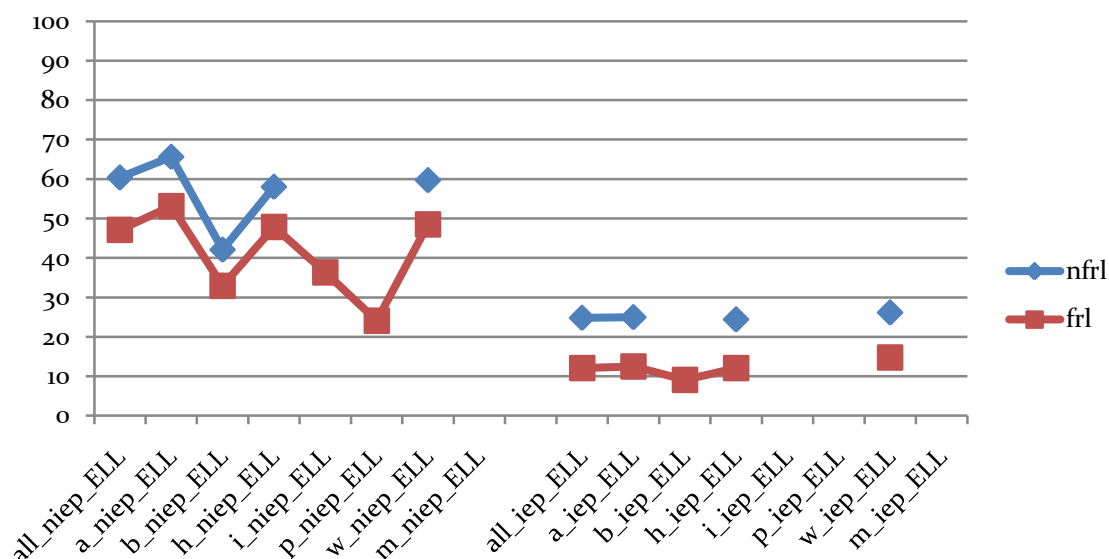
Table 11 ─ SES differences by Race and Disability for English Language Learners – Reading

Highest Achievement – NIEP NFRL	Asian – 65.65
Lowest Achievement – NIEP NFRL	Black – 42.11
Difference	23.54% Proficient
Highest Achievement – NIEP FRL	Asian – 53.16
Lowest Achievement – NIEP FRL	Pacific – 24.07
Difference	29.09% Proficient
Highest Achievement – IEP NFRL	White – 26.19
Lowest Achievement – IEP NFRL	Hispanic – 24.44
Difference	1.75% Proficient
Highest Achievement – IEP FRL	White – 14.75
Lowest Achievement – IEP FRL	Black – 9.09
Difference	5.66% Proficient
Greatest Gap – NIEP (NFRL - FRL)	All Students – 13.29
Smallest Gap – NIEP (NFRL - FRL)	Black – 9.17
Greatest Gap – IEP (NFRL - FRL)	All Students – 12.78
Smallest Gap – IEP (NFRL - FRL)	White – 11.44

        Again in the following, several groups are not represented because there were few or no students in the subgroups. Still, non-IEP is doing better than IEP, and the gaps are between 20 and 40 percentage points in most instances. Asian, Hispanic, and White FRL ELL students who are not on IEPs do better than Black non FRL ELL students who are not on IEPs. For ELL students, poor Asians, Hispanics, and Whites do better than Blacks who are not poor.

Figure 21 — Disability differences by Race and SES for English Language Learners - Reading
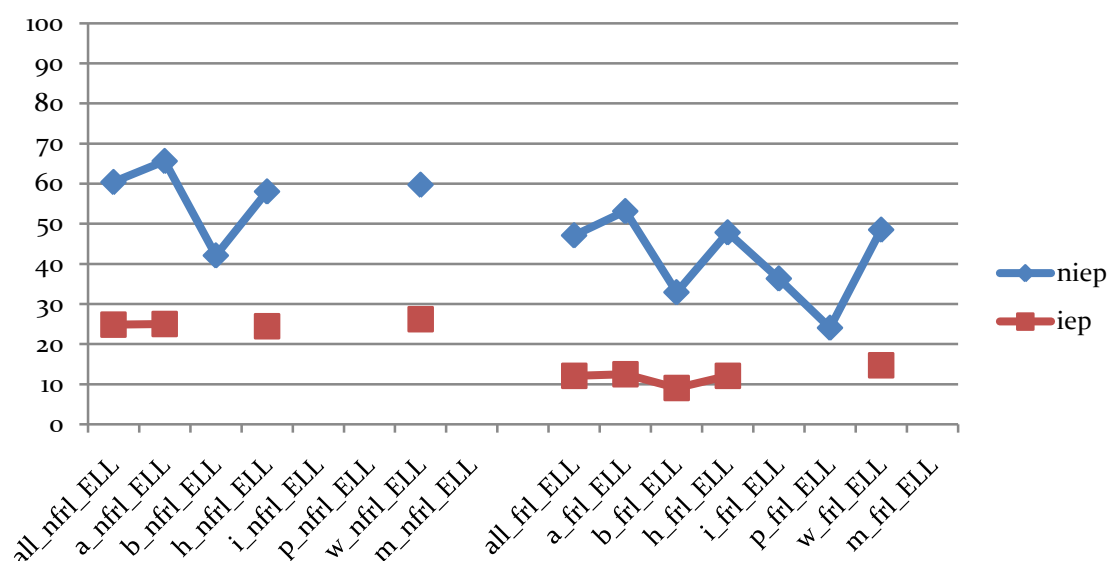
Table 12 — Disability differences by Race and SES for English Language Learners – Reading

Highest Achievement – NFRL NIEP	Asian – 65.65
Lowest Achievement – NFRL NIEP	Black – 42.11
Difference	23.54% Proficient
Highest Achievement – NFRL IEP	White – 26.19
Lowest Achievement – NFRL IEP	Hispanic – 24.44
Difference	1.75% Proficient
Highest Achievement – FRL NIEP	Asian – 53.16
Lowest Achievement – FRL NIEP	Pacific – 24.07
Difference	29.09% Proficient
Highest Achievement – FRL IEP	White – 14.75
Lowest Achievement – FRL IEP	Black – 9.09
Difference	5.66% Proficient
Greatest Gap – NFRL (NIEP - IEP)	Asian – 40.65
Smallest Gap – NFRL (NIEP - IEP)	White – 33.54
Greatest Gap – FRL (NIEP - IEP)	Asian – 40.66
Smallest Gap – FRL (NIEP - IEP)	Black – 23.85

Non-ELL students within IEP group, and regardless of FRL status, seem to be more similar than different. Between group differences still exist between IEP and non-IEP groups, regardless of FRL status. For NIEP-NELL, poor white students did better than non-poor Black students; poor Asian students did better than non-poor Black and Native American students. For IEP-NELL, poor Asian, Hispanic, white, and multi-racial students did better than non-poor Black students.

Figure 22 ─ SES differences by Race and Disability for non-English Language Learners - Reading
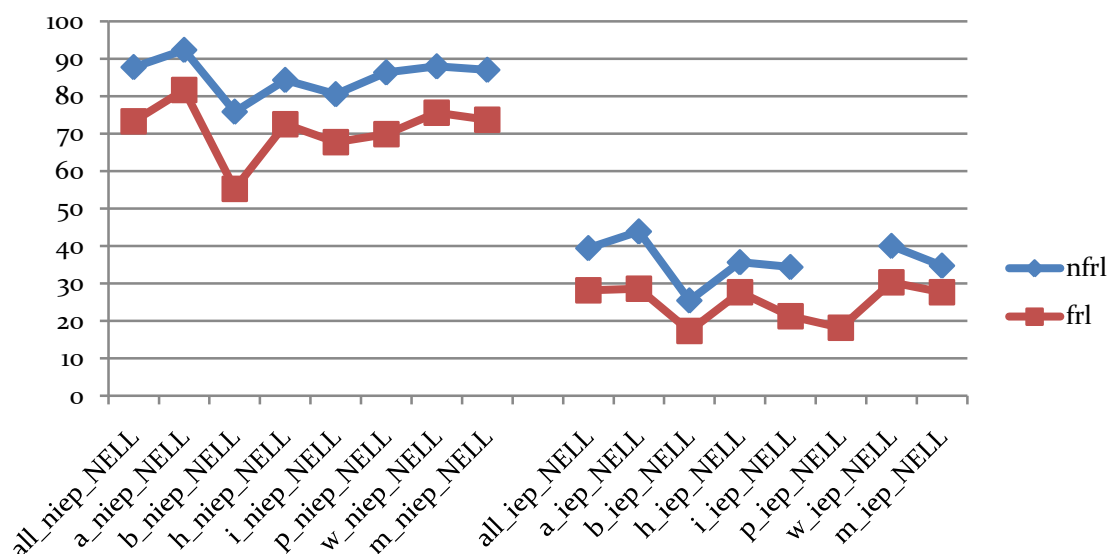
Table 13 ─ SES differences by Race and Disability for non-English Language Learners – Reading

Highest Achievement – NIEP NFRL	Asian – 92.32
Lowest Achievement – NIEP NFRL	Black – 75.83
Difference	16.49% Proficient
Highest Achievement – NIEP FRL	Asian – 81.68
Lowest Achievement – NIEP FRL	Black – 55.29
Difference	26.39% Proficient
Highest Achievement – IEP NFRL	Asian – 43.88
Lowest Achievement – IEP NFRL	Black – 25.47
Difference	18.41% Proficient
Highest Achievement – IEP FRL	White – 30.29
Lowest Achievement – IEP FRL	Black – 17.30
Difference	12.99% Proficient
Greatest Gap – NIEP (NFRL - FRL)	Black – 20.54
Smallest Gap – NIEP (NFRL - FRL)	Asian – 10.64
Greatest Gap – IEP (NFRL - FRL)	Asian – 15.31
Smallest Gap – IEP (NFRL - FRL)	Multi – 7.11

For non-ELL students, IEP/non-IEP gaps are significant, although differences due to FRL status are smaller.

Figure 23 ─ Disability differences by Race and SES for non-English language learners - Reading
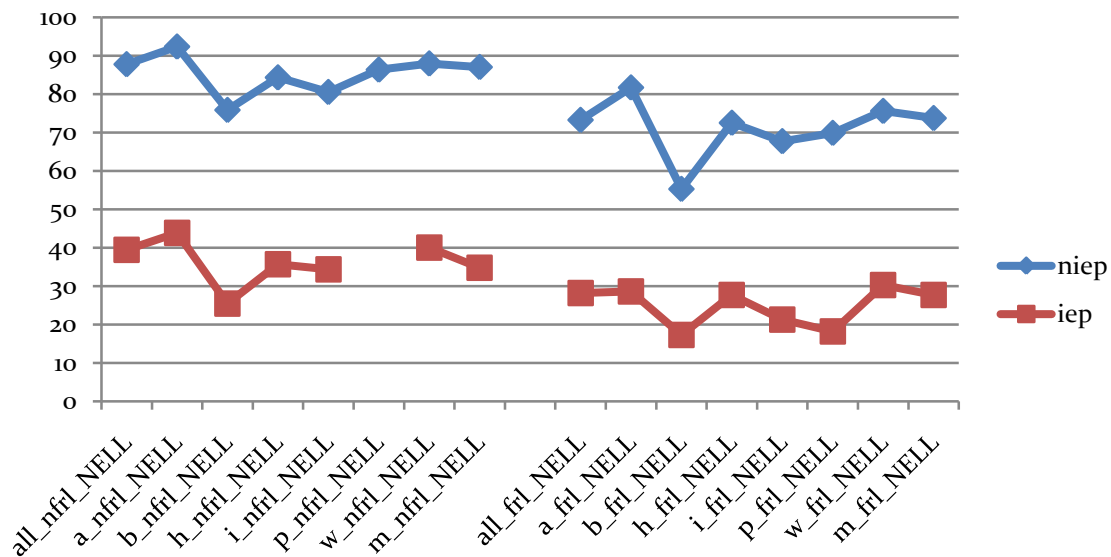
Table 14 ─ Disability differences by Race and SES for non-English language learners – Reading

Highest Achievement – NFRL NIEP	Asian – 92.32
Lowest Achievement – NFRL NIEP	Black – 75.83
Difference	16.49% Proficient
Highest Achievement – NFRL IEP	Asian – 43.88
Lowest Achievement – NFRL IEP	Black – 25.47
Difference	18.41% Proficient
Highest Achievement – FRL NIEP	Asian – 81.68
Lowest Achievement – FRL NIEP	Black – 55.29
Difference	26.39% Proficient
Highest Achievement – FRL IEP	White – 30.29
Lowest Achievement – FRL IEP	Black – 17.30
Difference	12.99% Proficient
Greatest Gap – NFRL (NIEP - IEP)	Multi – 52.24
Smallest Gap – NFRL (NIEP - IEP)	Native American – 46.12
Greatest Gap – FRL (NIEP - IEP)	Asian – 53.11
Smallest Gap – FRL (NIEP - IEP)	Black – 37.99

Again as shown in the figure following, Non FRL is doing better than FRL, and Non IEP is doing better than IEP overall. The gap appears to be widest for Pacific non-IEP students based on FRL/NFRL, followed by Black students. The gap is narrowest for Native American IEP students based on FRL/NFRL. For NIEP – poor Asians and whites did better than non-poor Blacks. For IEP – poor Native Americans and whites did better than non-poor Hispanics; poor Native Americans, Asians, and whites did better than non-poor Blacks.

Figure 24 ─ SES differences by Race and Disability - Math
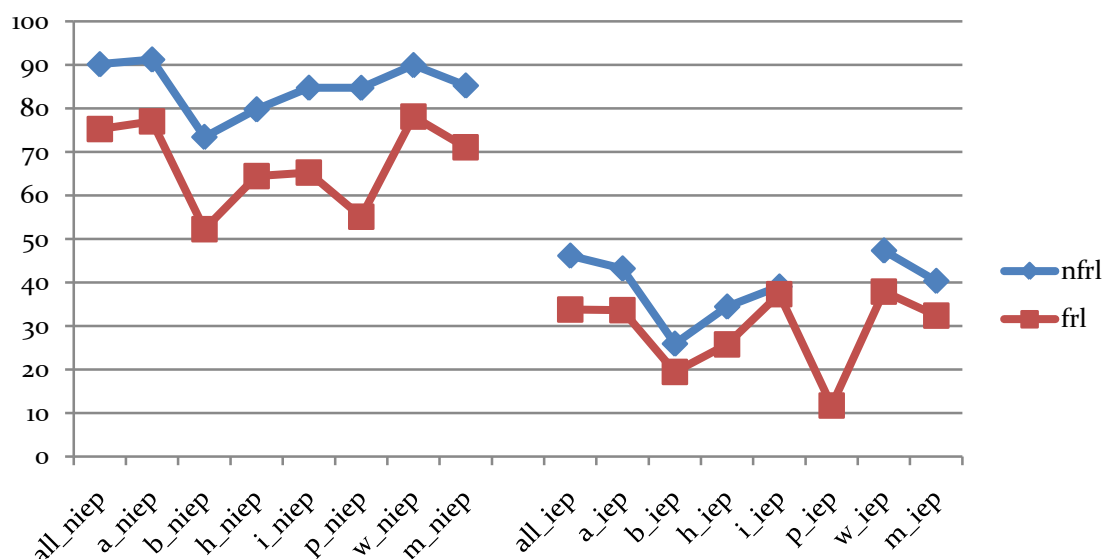
Table 15 ─ SES differences by Race and Disability – Math

Highest Achievement – NIEP NFRL	Asian – 91.21
Lowest Achievement – NIEP NFRL	Black – 73.42
Difference	17.79% Proficient
Highest Achievement – NIEP FRL	White – 78.07
Lowest Achievement – NIEP FRL	Black – 52.26
Difference	25.81% Proficient
Highest Achievement – IEP NFRL	All Students – 46.16
Lowest Achievement – IEP NFRL	Black – 25.94
Difference	20.22% Proficient
Highest Achievement – IEP FRL	White – 37.91
Lowest Achievement – IEP FRL	Pacific – 11.76
Difference	26.15% Proficient
Greatest Gap – NIEP (NFRL - FRL)	Pacific – 29.57
Smallest Gap – NIEP (NFRL - FRL)	White – 11.85
Greatest Gap – IEP (NFRL - FRL)	All Students – 12.36
Smallest Gap – IEP (NFRL - FRL)	Native American – 1.71

Again in the figure following, Non-IEP is doing better than IEP overall. The gap between IEP and non-IEP seems to be consistent for each race group based on FRL status. For NIEP, poor Asians and whites did better than non-poor Blacks. For IEP, poor Asians, Native Americans, and whites did better than non-poor Blacks; poor Native Americans and whites did better than non-poor Hispanics.

Figure 25 ─ Disability differences by Race and SES - Math
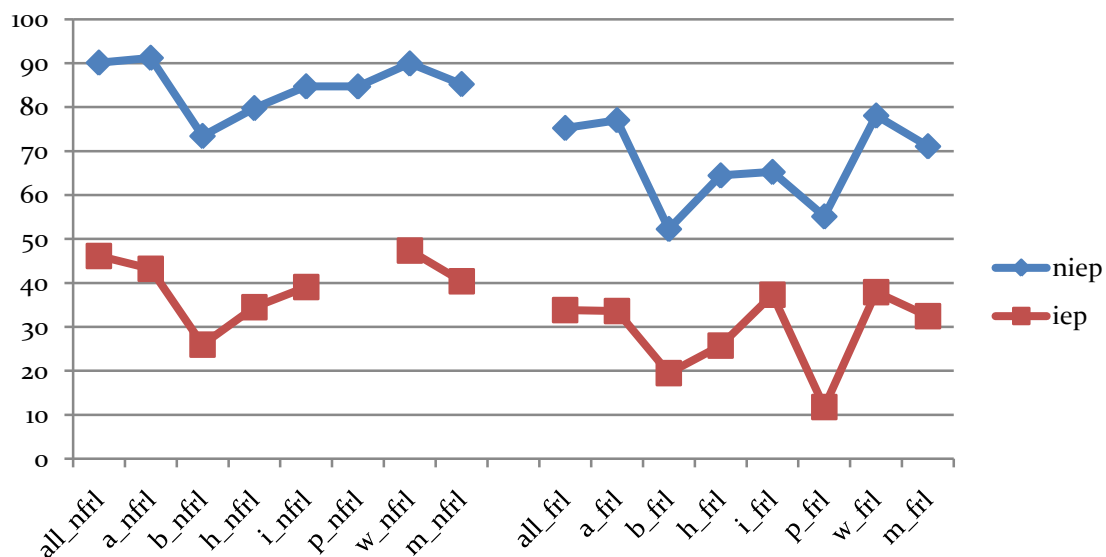
Table 16 ─ Disability differences by Race and SES – Math

Highest Achievement – NFRL NIEP	Asian – 91.21
Lowest Achievement – NFRL NIEP	Black – 73.42
Difference	17.79% Proficient
Highest Achievement – NFRL IEP	White – 47.34
Lowest Achievement – NFRL IEP	Black – 25.94
Difference	21.4% Proficient
Highest Achievement – FRL NIEP	White – 78.07
Lowest Achievement – FRL NIEP	Black – 52.26
Difference	25.81% Proficient
Highest Achievement – FRL IEP	White – 37.91
Lowest Achievement – FRL IEP	Pacific – 11.76
Difference	26.15% Proficient
Greatest Gap – NFRL (NIEP - IEP)	Asian – 47.99
Smallest Gap – NFRL (NIEP - IEP)	White – 42.58
Greatest Gap – FRL (NIEP - IEP)	Asian – 43.42
Smallest Gap – FRL (NIEP - IEP)	Native American – 27.89

For ELL students not on IEPs, Asian, Hispanic and White students on FRL out-perform Black students who are not FRL. Asian FRL students out-perform Hispanic and White non-FRL students. Asian IEP-ELL students on FRL out-perform Hispanic IEP-ELL students who are non-FRL.

Figure 26 ─ SES differences by Race and Disability for English language learners - Math
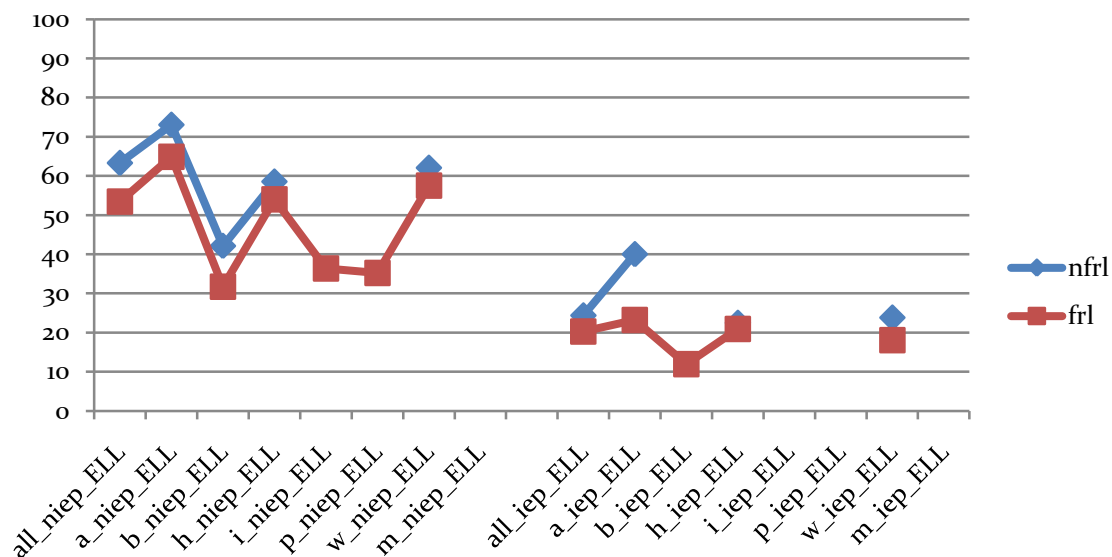
Table 17 ─ SES differences by Race and Disability for English language learners – Math

Highest Achievement – NIEP NFRL	Asian – 73.04
Lowest Achievement – NIEP NFRL	Black – 42.11
Difference	30.93% Proficient
Highest Achievement – NIEP FRL	Asian – 64.87
Lowest Achievement – NIEP FRL	Black – 31.68
Difference	33.19% Proficient
Highest Achievement – IEP NFRL	Asian – 40.00
Lowest Achievement – IEP NFRL	Hispanic – 22.47
Difference	17.53% Proficient
Highest Achievement – IEP FRL	Asian – 23.21
Lowest Achievement – IEP FRL	Black – 11.94
Difference	11.27% Proficient
Greatest Gap – NIEP (NFRL - FRL)	Black – 10.43
Smallest Gap – NIEP (NFRL - FRL)	Hispanic – 4.53
Greatest Gap – IEP (NFRL - FRL)	Asian – 16.79
Smallest Gap – IEP (NFRL - FRL)	Hispanic – 1.59

For FRL ELL students, a large performance gap exists between non-IEP and IEP students. For non-FRL ELL students, there is a large performance gap based on IEP status. Asians on FRL outperformed Blacks, Hispanics, and Whites who were not FRL. Hispanics and Whites on FRL outperformed Blacks who were not FRL.

Figure 27 ─ Disability differences by Race and SES for English language learners - Math
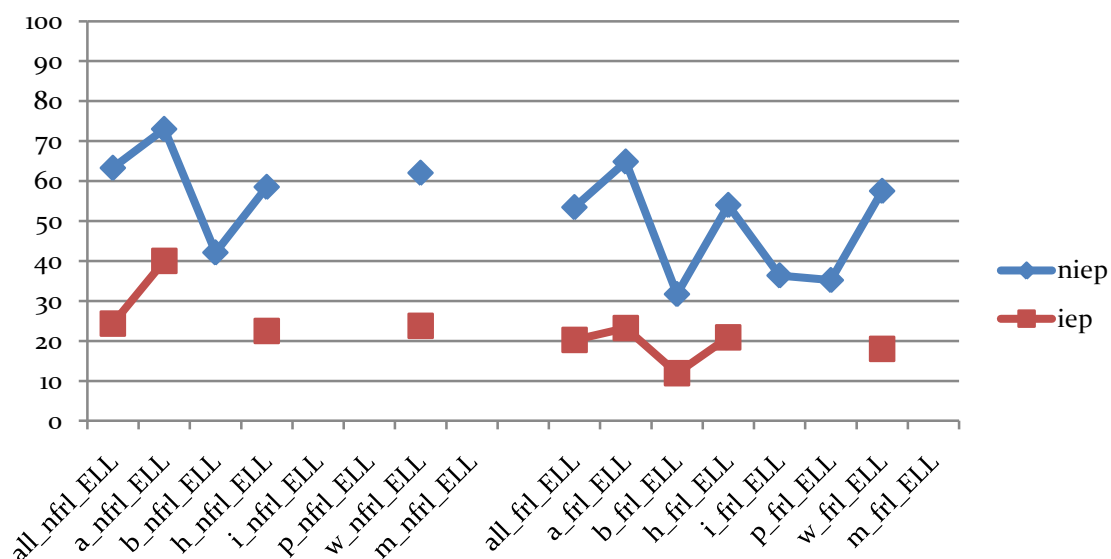
Table 18 ─ Disability differences by Race and SES for English language learners – Math

Highest Achievement – NFRL NIEP	Asian – 73.04
Lowest Achievement – NFRL NIEP	Black – 42.11
Difference	30.93% Proficient
Highest Achievement – NFRL IEP	Asian – 40.00
Lowest Achievement – NFRL IEP	Hispanic – 22.47
Difference	17.53% Proficient
Highest Achievement – FRL NIEP	Asian – 64.87
Lowest Achievement – FRL NIEP	Black – 31.68
Difference	33.19% Proficient
Highest Achievement – FRL IEP	Asian – 23.21
Lowest Achievement – FRL IEP	Black – 11.94
Difference	11.27% Proficient
Greatest Gap – NFRL (NIEP - IEP)	All Students – 38.94
Smallest Gap – NFRL (NIEP - IEP)	Asian – 33.04
Greatest Gap – FRL (NIEP - IEP)	Asian – 41.66
Smallest Gap – FRL (NIEP - IEP)	Black – 19.74

Non-ELL students within IEP group, and regardless of FRL status, are more similar than different. There is a larger performance gap for Black non-IEP students based on FRL status. Between group differences still exist between IEP and non-IEP groups. White students on IEPs and not FRL perform nearly as well as Black students not on IEPs and FRL. Asian and White FRL-NIEP did better than Black NFRL-NIEP. All subgroups (except Pacific) on FRL and IEP performed better than Black NFRL-IEP.

Figure 28 ─ SES differences by Race and Disability for non-English language learners - Math
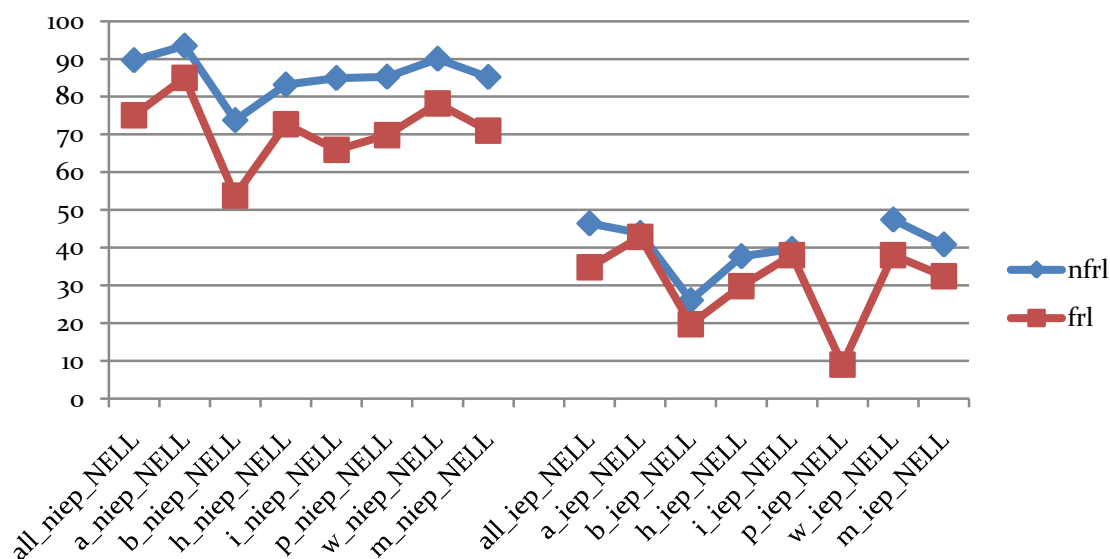
Table 19 ─ SES differences by Race and Disability for non-English language learners – Math

Highest Achievement – NIEP NFRL	Asian – 93.45
Lowest Achievement – NIEP NFRL	Black – 73.76
Difference	19.69% Proficient
Highest Achievement – NIEP FRL	Asian – 85.00
Lowest Achievement – NIEP FRL	Black – 53.81
Difference	31.19% Proficient
Highest Achievement – IEP NFRL	White – 47.43
Lowest Achievement – IEP NFRL	Black – 26.10
Difference	21.33% Proficient
Highest Achievement – IEP FRL	Asian – 42.86
Lowest Achievement – IEP FRL	Pacific – 9.09
Difference	33.77% Proficient
Greatest Gap – NIEP (NFRL - FRL)	Black – 19.95
Smallest Gap – NIEP (NFRL - FRL)	Asian – 8.45
Greatest Gap – IEP (NFRL - FRL)	All Students – 11.66
Smallest Gap – IEP (NFRL - FRL)	Asian – 1.02

For non-ELLs, IEP/non-IEP gaps are significant, and similar for FRL and non-FRL groups. Asian and White FRL-NIEP did better than Black NFRL-NIEP. Asian, Native American, Hispanic, and White and Multi FRL-IEP did better than Black NFRL-IEP.

Figure 29 — Disability differences by Race and SES for non-English language learners - Math
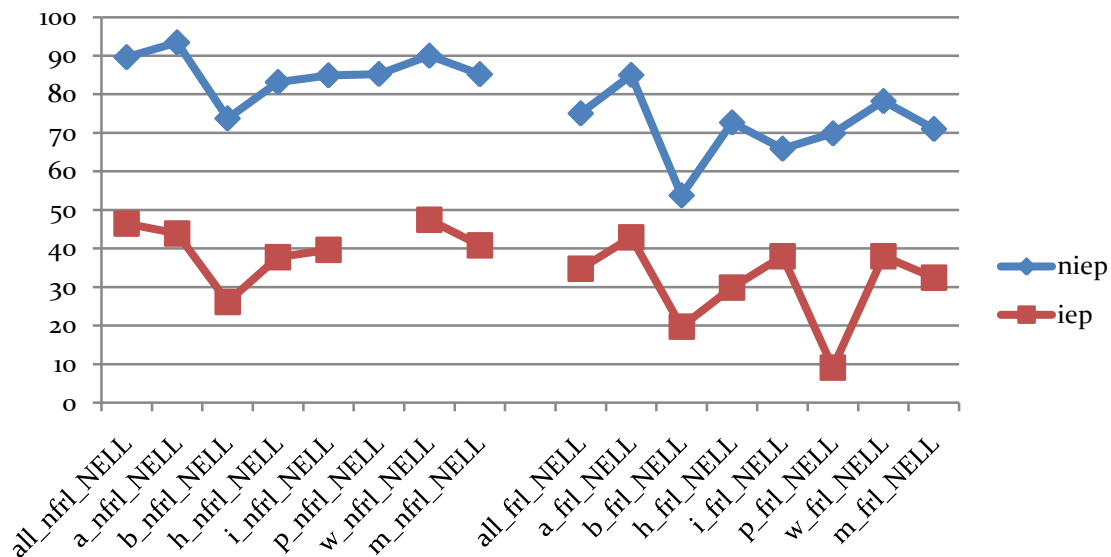
Table 20 — Disability differences by Race and SES for non-English language learners – Math

Highest Achievement – NFRL NIEP	Asian – 93.45
Lowest Achievement – NFRL NIEP	Black – 73.76
Difference	19.69% Proficient
Highest Achievement – NFRL IEP	White – 47.43
Lowest Achievement – NFRL IEP	Black – 26.10
Difference	21.33% Proficient
Highest Achievement – FRL NIEP	Asian – 85.00
Lowest Achievement – FRL NIEP	Black – 53.81
Difference	31.19% Proficient
Highest Achievement – FRL IEP	Asian – 42.86
Lowest Achievement – FRL IEP	Pacific – 9.09
Difference	33.77% Proficient
Greatest Gap – NFRL (NIEP - IEP)	Asian – 49.57
Smallest Gap – NFRL (NIEP - IEP)	White – 42.58
Greatest Gap – FRL (NIEP - IEP)	Pacific – 60.77
Smallest Gap – FRL (NIEP - IEP)	Native American – 27.86

What Influences Student Achievement?

The factors influencing student achievement is explored. Student achievement at eighth grade is predicted using a cohort of Iowa students' previous test scores and demographic variables. Utilizing state student identifiers (known as Iowa student numbers), a five year matched cohort group was tracked from fourth through eighth grade. Iowa Tests of Basic Skills (ITBS) scores and demographic information were matched across years in order to track district mobility and academic progress of individual students.

School districts in Iowa retain local control of when they administer the ITBS assessment. Based on when students were tested during the year, their test score may be standardized to fall, midyear, or spring norms. These three norms groupings are not directly comparable with one another. Therefore, all national scale scores (NSS) were converted to z-scores with a mean of zero and standard deviation of one for direct comparison among all norm groups.

Using multiple regression analysis, a model is built to predict academic achievement (NSS in reading, mathematics, and science each, converted to z-score) in the eighth grade year. Dependent variables of interest include: previous academic achievement, race/ethnicity, special education, free or reduced price lunch eligibility (low socioeconomic status), talented and gifted, gender, English language learner, migrant, student attendance rate, number of district moves, and district enrollment (size). Demographic indicators are taken from the student's eighth grade year.

Results

Multiple regression results predicting 8th grade academic achievement are based on demographics and program indicators. Coefficients and standard errors are presented in Tables 21 through 23.

Table 21 ─ Factors Related with 8th Grade Reading Achievement

	8th Grade Reading NSS Z-Score	
	Coefficient	(Std)
4th Grade Reading NSS Z-Score	0.667*	(0.005)
Race/Ethnicity (white is baseline)		
African American	-0.162*	(0.020)
Asian	0.069*	(0.030)
Hispanic	0.000	(0.018)
Native American	-0.048	(0.053)
Native Hawaiian/Pacific Islander	-0.170	(0.142)
Two or More Races	-0.013	(0.028)
Gender (male is baseline)		
Female	-0.059*	(0.007)
Special Education	-0.441*	(0.012)
Low SES	-0.124*	(0.009)
Talented and Gifted	0.386*	(0.012)
ELL	-0.149*	(0.029)
Migrant	-0.057	(0.171)
Attendance Rate	0.638*	(0.075)
Number of District Transitions (zero is baseline)	-0.025	(0.013)
One	-0.040	(0.026)
Two or more		
District Enrollment (less than 1000 is baseline)	0.091*	(0.010)
1000 to 2499	0.069*	(0.009)
2500 or more		
r-square=0.581		

Note: *$p<0.05$

Table 22 — Factors Related with 8th Grade Mathematics Achievement

	8th Grade Mathematics NSS Z-Score	
	Coefficient	(Std)
4th Grade Mathematics NSS Z-Score	0.750*	(0.005)
Race/Ethnicity (white is baseline)		
African American	-0.177*	(0.019)
Asian	0.159*	(0.028)
Hispanic	-0.060*	(0.016)
Native American	-0.109*	(0.049)
Native Hawaiian/Pacific Islander	-0.191	(0.132)
Two or More Races	-0.061*	(0.026)
Gender (male is baseline)		
Female	-0.063*	(0.007)
Special Education	-0.460*	(0.011)
Low SES	-0.138*	(0.008)
Talented and Gifted	0.316*	(0.011)
ELL	-0.100*	(0.027)
Migrant	-0.018	(0.144)
Attendance Rate	1.081*	(0.071)
Number of District Transitions (zero is baseline)		
One	-0.029*	(0.012)
Two or more	-0.033	(0.025)
District Enrollment (less than 1000 is baseline)		
1000 to 2499	0.098*	(0.009)
2500 or more	0.034*	(0.009)
r-square=0.639		

Note: *$p < 0.05$

Table 23 – Factors Related with 8th Grade Science Achievement

	8th Grade Science NSS Z-Score	
	Coefficient	(Std)
4th Grade Science NSS Z-Score	0.518*	(0.005)
Race/Ethnicity (white is baseline)		
African American	-0.164*	(0.022)
Asian	0.142*	(0.034)
Hispanic	-0.033	(0.020)
Native American	-0.165*	(0.059)
Native Hawaiian/Pacific Islander	-0.142	(0.155)
Two or More Races	0.028	(0.032)
Gender (male is baseline)		
Female	-0.007	(0.008)
Special Education	-0.505*	(0.013)
Low SES	-0.114*	(0.010)
Talented and Gifted	0.380*	(0.013)
ELL	-0.204*	(0.032)
Migrant	-0.047	(0.185)
Attendance Rate	0.902*	(0.085)
Number of District Transitions (zero is baseline)		
One	-0.011	(0.015)
Two or more	-0.005	(0.030)
District Enrollment (less than 1000 is baseline)		
1000 to 2499	0.115*	(0.011)
2500 or more	0.063*	(0.010)
r-square=0.504		

Note: *$p<0.05$

     Looking at variables which are statistically significant across reading, mathematics, and science and converting their relationship with 8th grade z-scores back to NSS, being a special education student decreases NSS in 8th grade in reading, mathematics, and science by approximately 9, 11, and 11 points, respectively. The 8th grade reading, mathematics, and science NSS of African American students decrease by approximately 4 NSS points, low SES 8th grade reading, mathematics, and science NSS also decreased by about 3 points. The 8th grade reading, mathematics, and science NSS of talented and gifted students increased by approximately 7 points. Eighth grade NSS for ELL students decreases by 3 points for reading, 2 points for mathematics, and 5 points for science. Using the model, 8th grade achievement can be predicted to explore achievement gaps between subgroups. The predicted achievement in the figures below is attributed to the variable listed only.

Figure 30 ─ Predicted reading achievement by IEP status

Reading Achievement by IEP
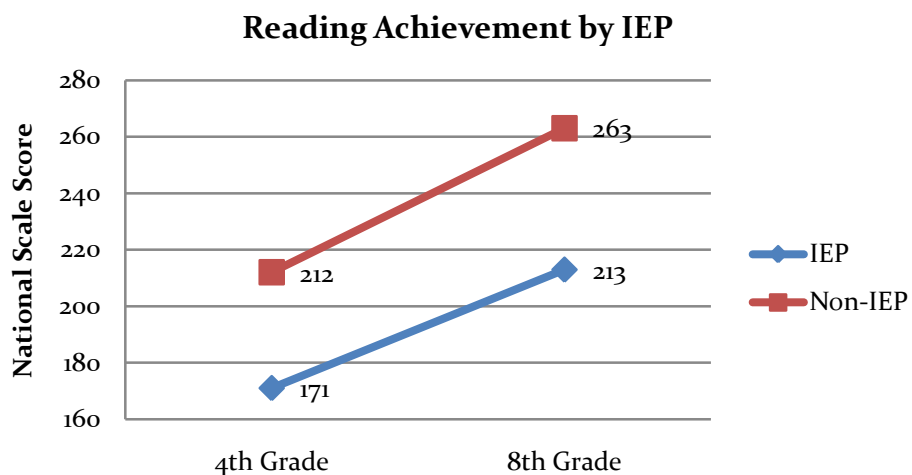
Figure 31 ─ Predicted mathematics achievement by IEP status

Mathematics Achievement by IEP
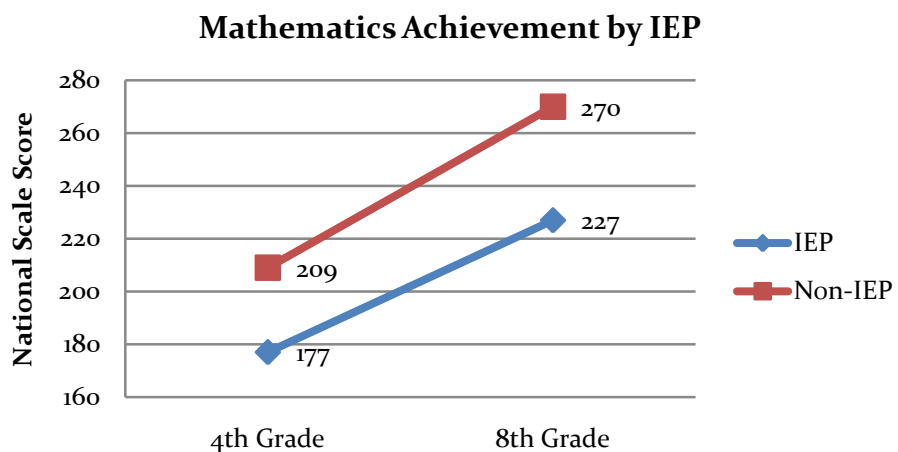
Figure 32 ─ Predicted science achievement by IEP status

Science Achievement by IEP
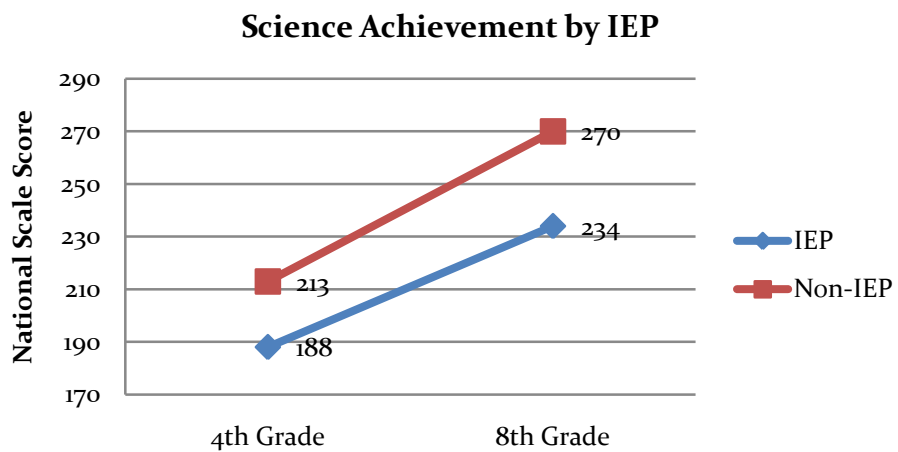
Figure 33 ─ Predicted reading achievement by Low SES status

Reading Achievement by Low SES
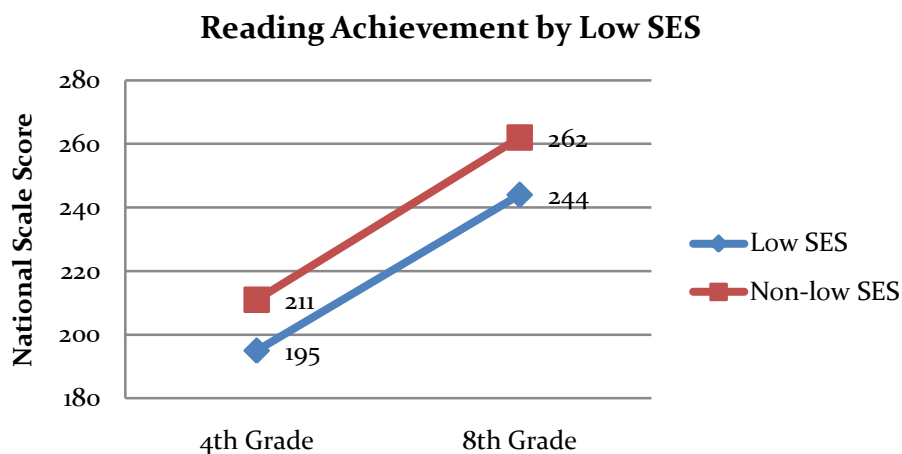
Figure 34 ─ Predicted mathematics achievement by Low SES status

Mathematics Achievement by Low SES
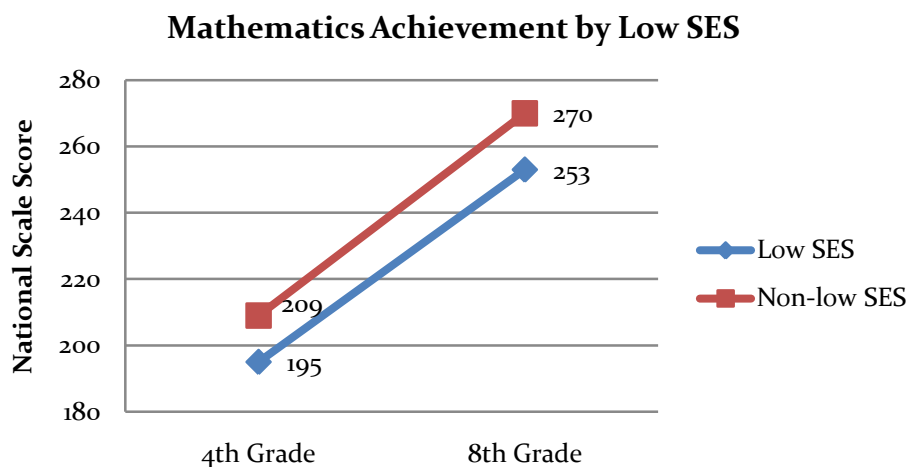
Figure 35 ─ Predicted science achievement by Low SES status

Science Achievement by Low SES
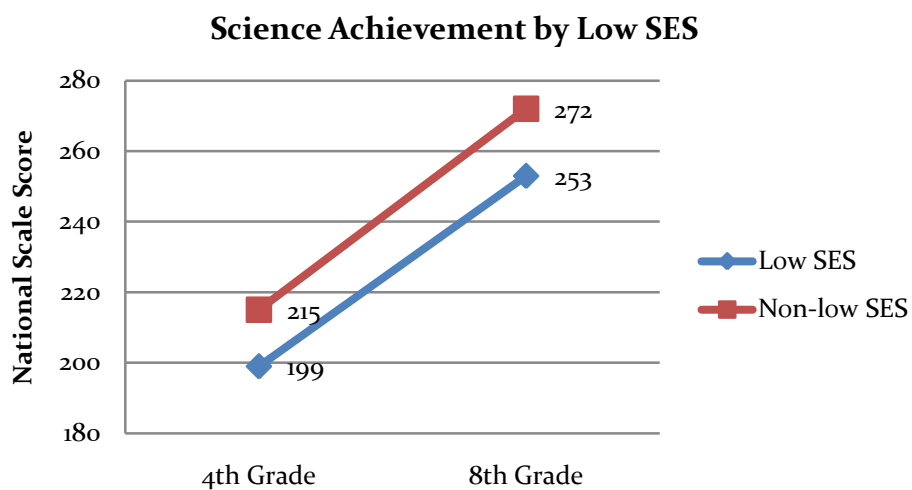
Figure 36 ─ Predicted reading achievement by ELL status

Reading Achievement by ELL
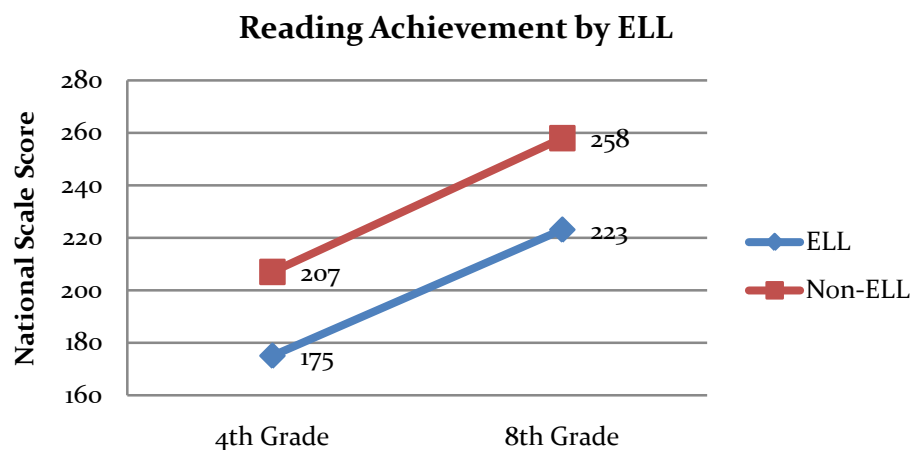
Figure 37 ─ Predicted mathematics achievement by ELL status

Mathematics Achievement by ELL
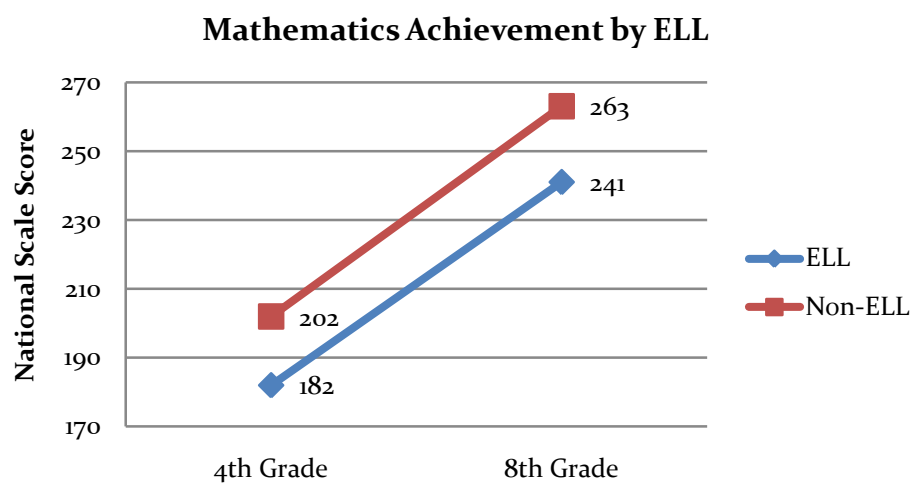
Figure 38 ─ Predicted science achievement by ELL status

Science Achievement by ELL
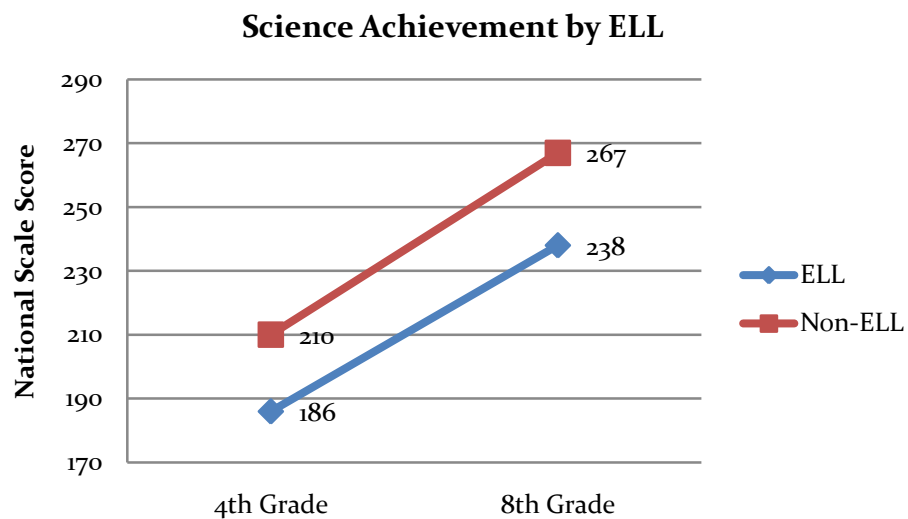
Figure 39 — Predicted science achievement by race/ethnicity status

Reading Achievement by Race/Ethnicity
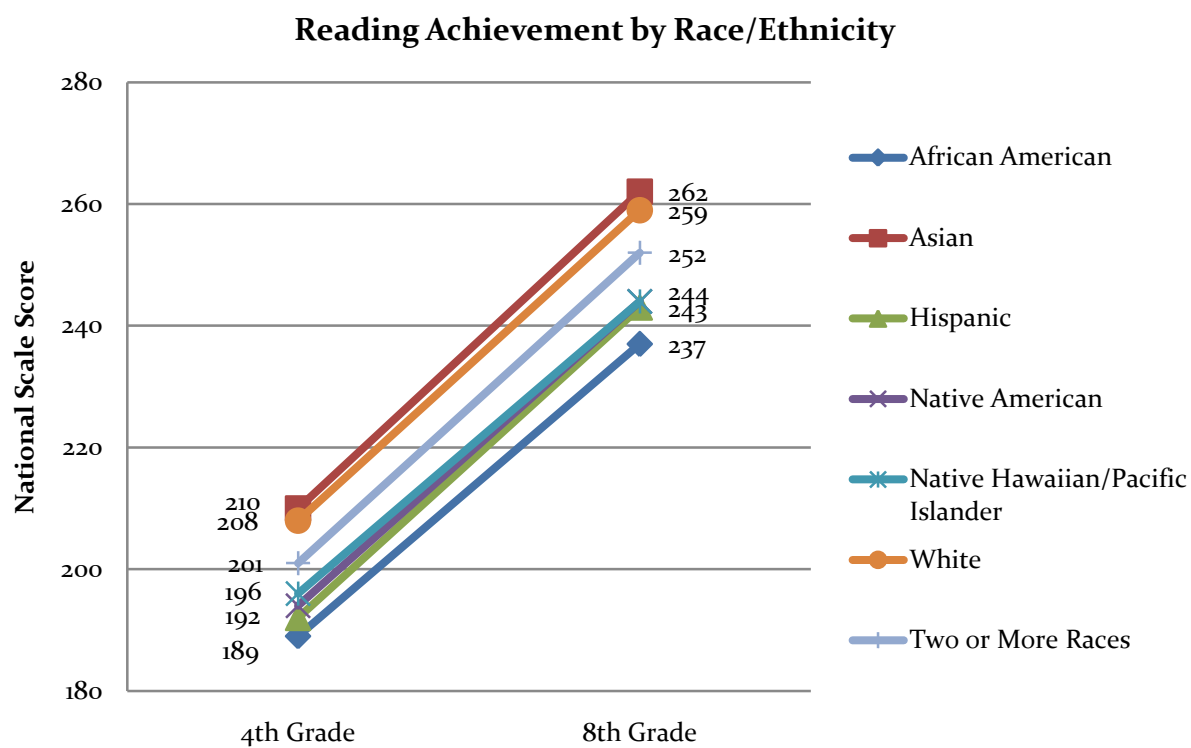
Figure 40 — Predicted mathematics achievement by race/ethnicity status

Mathematics Achievement by Race/Ethnicity
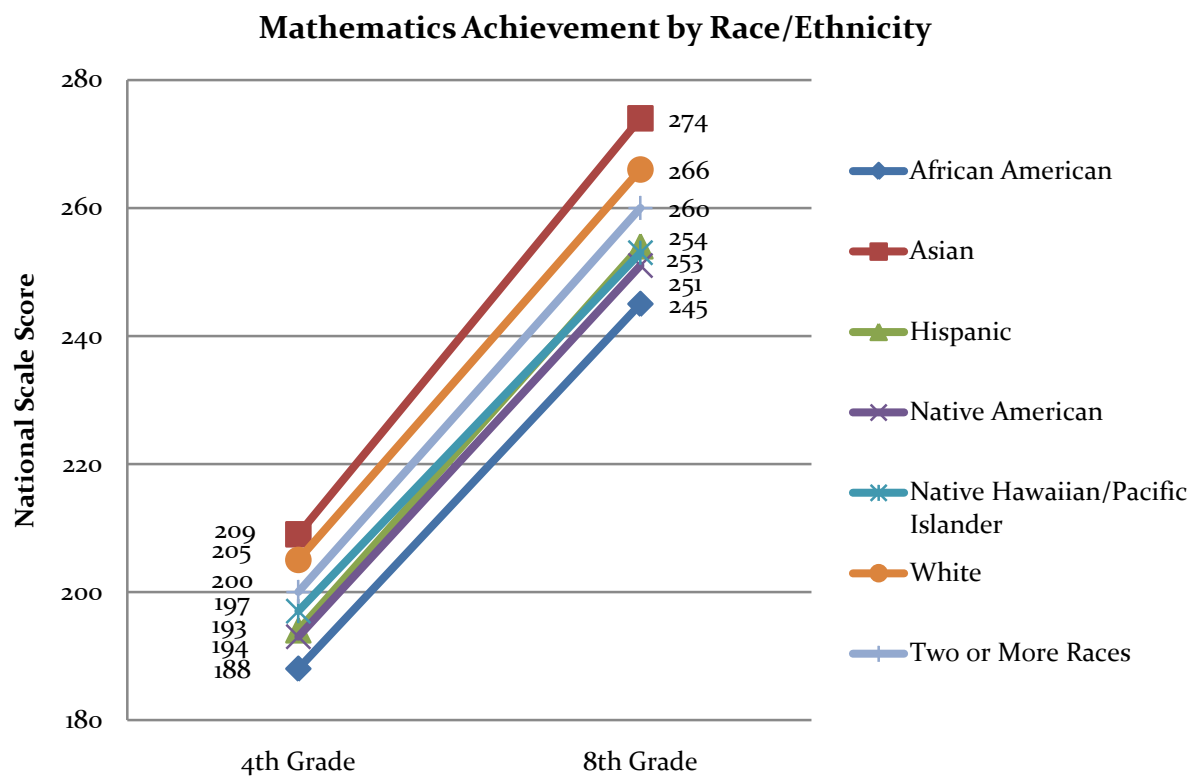
Figure 41 — Predicted science achievement by race/ethnicity status

Science Achievement by Race/Ethnicity
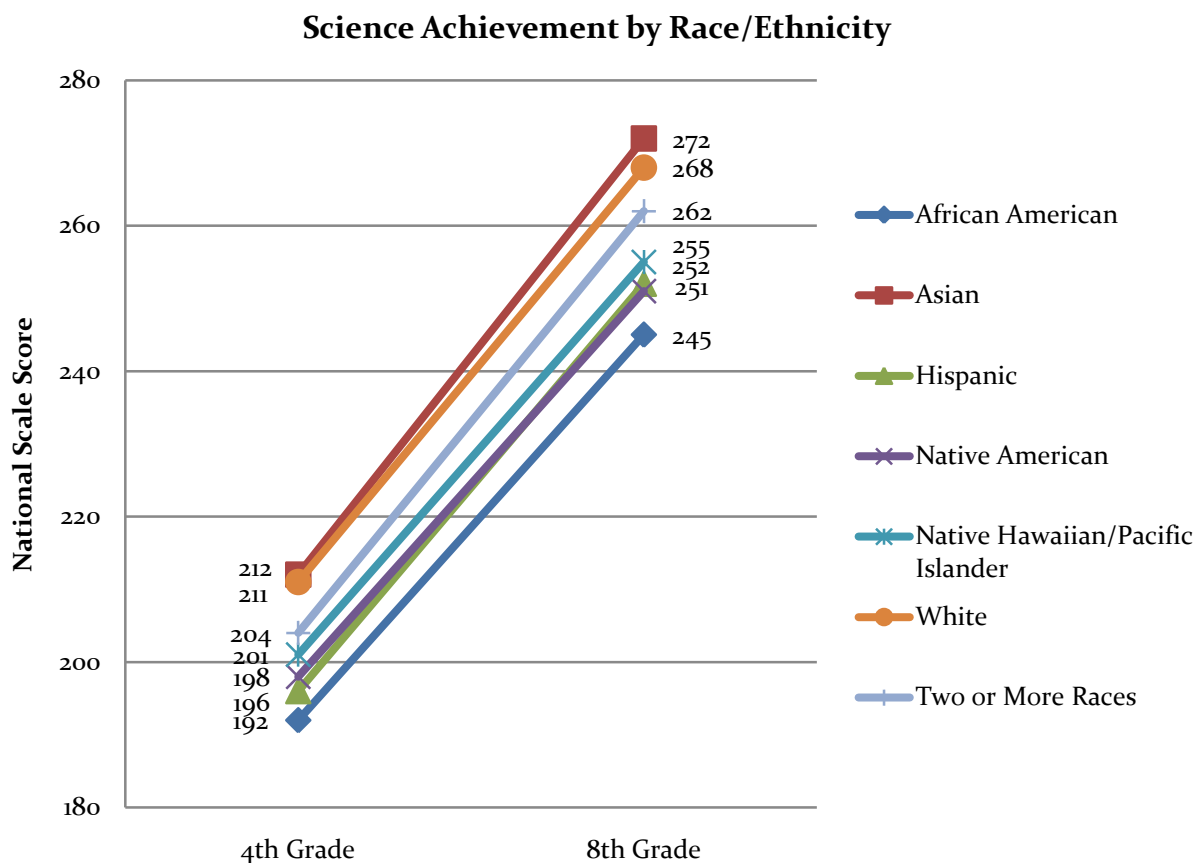
Conclusions

IEP status has the largest effect on student achievement. Students with IEPs in the cohort did not achieve the same rate of growth as their non-IEP peers, slipping on average 9 NSS points in reading and 11 NSS points in mathematics and science. Low SES students lost about 3 NSS points in their rate of growth in reading, mathematics, and science, compared to non-low SES students. ELL student also lost ground in their achievement compared to non-ELL students. ELL students lost about 3 NSS points in reading, 2 NSS points in mathematics, and 5 NSS points in science. African American students also did not achieve the same rate of growth as their White peers, losing on average 4 NSS points in reading, mathematics, and science.

The loss in achievement gains may not be considerably large for some subgroups. However, when a student belongs to more than one subgroup, the effects of the subgroups are additive. This may result in major achievement gaps for students who belong to more than one subgroup.

Course Taking Patterns and ACT Assessment Results by Race/Ethnicity

Student level data were used to examine the relationship between student performance on ACT Mathematics and course-taking in mathematics. The purpose is to tease out earlier achievement, coursework and later achievement. In order to achieve the objective, students' ninth grade ITED Mathematics results four years prior were used as a baseline measure to control for achievement levels and subsequent course-taking patterns were assessed to determine the impact on ACT scores. An effort was made to study the education opportunities and outcomes of students from different subgroups and schools in different sizes. The results support that higher level mathematics courses taken has a strong impact on ACT Mathematics scores for all students in study across all achievement levels.

The purposes of this research are: 1) to examine the relationship between students' performance on the ACT assessment and their high school courses taken, 2) to compare education opportunities and outcomes for students from different demographic subgroups and from schools/districts in different enrollment sizes, and 3) to see the impact of students' course taken on their later outcomes for students in all achievement levels by controlling for students' pre-course taken achievement. This study examines one particular content area, mathematics, in order to provide a specific example of how coursework impacts long term college readiness and career readiness.

The relationship between student coursework and achievement has been a common topic for educators, test developers and researchers for a half century. Studies show positive correlation between students' courses taken in certain subject areas and their later performance on achievement tests (Cavanagh, 2007; Sawyer et al., 1988) and positive correlation between number of courses a student takes in the relevant area and student's achievement scores (Laing et al., 1987). In addition, some studies have focused on the relationships between advanced course taken and students' performance (Rock, 1995; Wang and Snyder, 2006) and the findings are: students who take the higher level courses show greater gains in mathematics and science. Some researchers also pay attention on impact of rigorous courses on performance for students in subgroups (Coley, 1999; Dervarics, 2005). The studies show that African American and low-income students can succeed in rigorous courses, but too few get the opportunity. As these studies grow, the data available and possible questions for further investigation also increase.

Over 19,000 seniors in 2007-2008 who were enrolled in an Iowa public school from 2004-2005 to 2007-2008 and took ACT in grades eleven or twelve were included in this study. Approximately 150 students in this graduating class who took ACT in grades seven to ten were eliminated from the analyses because a student would have only taken a partial set of courses before taking ACT. ACT provided the assessment scores for the graduating class of 2008. This data set included a self-reported courses-taken core status. Students' background information and four years of school-reported courses-taken were available from the Iowa Department of Education student-level data collections through Project EASIER. The ITED Mathematics National Percentile Rank (NPR) and National Standard Scores (NSS) four years prior for the graduating class 2008 were available from Iowa Testing Programs. Students included in the study took the ITED Mathematics when they were in ninth grade, but because Iowa does not require ninth graders to take ITED, only 16,000 of the 19,000 ACT test-takers (or 84.2 percent) took ITED Mathematics in 2004-2005. After matching student records from the three data sources, over 16,000 students remained in the study.

Test Scores: The ACT Mathematics score for each student was the outcome variable in this study. The ACT scores range from 1 to 36. A z-score was created using the student's ITED Mathematics Standard Score with 0 as the mean and 1 as the standard deviation. The ITED can be administered between September and May each year. Three separate norms are used for each of the test periods (fall, mid-year and spring) to yield standard scores. The converted z-score makes it possible to pool the scores from the three periods together. The ITED Mathematics z-score was used as one of the predictors in the regression models. The ITED Mathematics NPR scores were used as baseline performance to control student pre course-taken achievement levels. The ITED has five achievement levels: Low or below proficient (NPR scores less than 41); Low-Intermediate (NPR scores between 41 and 75); High-Intermediate (NPR scores between 76 and 89); Low-High (NPR scores between 90 and 94); and High-High (NPR scores between 95 and 99).

Courses Taken: The higher level mathematics courses included in this study were Pre-Calculus, Calculus, Advanced Placement (AP) Calculus, Trigonometry, and AP Statistics. In the regression analyses, the

scale for HLM courses taken was coded in a range of 0 to 4: '0' indicates that a student took no higher level mathematics courses; '1' indicates that a student began taking HLM courses in grade 12; '2' indicates that a student began taking HLM courses in grade 11; '3' indicates that a student began taking HLM courses in grade 10; and '4' indicates that a student began taking HLM courses in ninth grade. Therefore, a higher value of HLM means that not only did a student take HLM courses early, but also that the student had the opportunities to take more HLM courses. In the descriptive statistics, the HLM courses taken pattern was coded as '0' and '1': '0' indicates that a student took no higher level mathematics courses and '1' indicates that a student took at least one HLM course. Algebra II taken was defined as a separate indicator in this study. The scale for taking Algebra II was also from 0 to 4. '0' indicates no Algebra II was taken and '4' indicates that a student took the course in grade nine. One additional coursework variable used in the study was student self-reported core (value 1) and less than core (value 0) status. ACT defines high school consisting of four or more years of English and three or more years of mathematics, science and social studies each as core.

Students' Demographic Characteristics: The following student demographic variables were used as predictor variables in regression analyses: gender ('1' for males and '0' for females), race/ethnicity, free or reduced price lunch eligibility ('1' for eligible and' 0' for not eligible), status of Limited English Proficient (LEP, '1' for LEP and '0' for not LEP), and student disability status (determined by Individual Education Plan/Program-IEP, '1' for IEP and '0' for not IEP). Race/ethnicity was coded as a dummy variable in the study where '1' indicates an African American, American Indian and Hispanic and '0' indicates Asian and White.

District Size: Districts' certified enrollments in 2007-2008 were entered in regression models as one of the main effect predictors. To examine the interaction effect between HLM courses taken and enrollment, size categories were created as follows: Size '1' indicates a district enrollment less than 300, '2' for enrollment in a range of 300 to 599, '3' for enrollment between 600 and 999, '4' for enrollment between 1,000 and 2,499, '5' for enrollment between 2,500 and 7,499, and '6' for enrollment as 7,500 or more. Since the main effect predictor of HLM courses taken is in a scale of 0 to 4 and enrollment size is from 1 to 6, the interaction of HLM and enrollment size combined can be 0 to 24.

Students in the Study: Over 16,000 student records included in the study had valid ACT Mathematics and ITED Mathematics scores. Among them, about 100 students (or less than 1 percent) did not have race/ethnicity codes. More than 2,000 ACT test-takers (less than 13 percent) did not report their core status.

The ACT Mathematics score was the outcome (dependent) variable in all of the simple and multiple regression models. The main effect predictors included: ITED Mathematics z-score as a measure of prior achievement; five student demographic variables: gender, race/ethnicity, LEP, IEP and free or reduced price lunch eligibility; three coursework variables: ACT core status, Algebra II taken and HLM courses taken; and district enrollment. First, as many as 10 independent variables were paired with ACT Mathematics score one by one in order to examine the correlation between each predictor variable with the outcome variable and to determine the contribution from each predictor variable to ACT Mathematics scores. The study reports all potential models with a predictor's p value from P<.001 to P<.0001. Second, some multiple regressions were applied to include all possible combinations of two or more predictor variables. The early multiple regressions were applied to two predictors and the later regressions included six or seven main effect predictors. To compare models, the author reports coefficient of multiple determination criterion (R-Square) and adjusted coefficient of multiple determination criterion (Adj R-Square) for each model and p value for each of the predictors. All the simple and multiple regression models were pursued to examine the contributions of predictor variable or combined predictor variables to predict the dependent variable - ACT Mathematics scores.

Some descriptive statistics and effect size analyses were used to compare the average scores of ACT Mathematics and the variances between the students who took higher level mathematics courses to the students who didn't. Also, similar analyses were used to examine the relationships between student ACT scores by student free or reduced-price lunch status. Students' achievement levels attained prior to take higher level courses and defined by ITED (Low/below proficient, Low-intermediate, High-intermediate, Low-high, and

High-high) were controlled for all students to ascertain the impact of the courses taken on student outcome scores on ACT Mathematics.

About 60 percent of the Iowa high school graduates took ACT during their junior or senior years. Because this study is restricted to the graduates who took ACT, it contains less information about the graduates who did not take ACT. The percent of the ACT test-takers who took higher level mathematics was much higher (over 62 percent) than the percent of Non-ACT test-takers who took HLM (over 15 percent, see Table 1). Generally speaking, the ACT test-takers are higher achievers in high school and most of them will pursue postsecondary education. It is also likely that the students in this study would perform relatively better than those not in the study on an end-of-school test if such a test existed for all high school graduates. Because of the nature of the ACT test-takers, it may lower the R-Square values in regressions between the outcome and predictor variables and lower the effect sizes between HLM courses taken and non-HLM courses taken groups on their outcome scores. More specifically, the minimum ACT Mathematics score for the students in this study was 11. If all Iowa graduates took ACT, the score range could be 1 to 36 instead of 11 to 36.

Table 24 — Simple and Multiple Regressions with ACT Mathematics as Dependent Variables

Independent Variables	Model DF	Error DF	MSE	R-Sq	Adj R-Sq	P
ITED_Mathematics Z Score	1	16036	10.90	0.5323	0.5323	<.0001
HLM (0-4)	1	16036	15.51	0.3345	0.3344	<.0001
Algebra_II (0-4)	1	16036	19.96	0.1435	0.1434	<.0001
ACT_Core (Core=1, NonCore=0)	1	13960	21.70	0.0609	0.0608	<.0001
Gender (Male=1, Female=0)	1	16036	22.71	0.0252	0.0252	<.0001
Free/Reduced Price Lunch	1	16036	22.86	0.0192	0.0191	<.0001
Race/Ethnicity (B/H/ I=1; A/W=0)	1	15928	22.89	0.0176	0.0176	<.0001
LEP (LEP=1, Non-LEP=0)	1	16036	23.24	0.0027	0.0026	<.0001
District Enrollment	1	15929	23.29	0.0004	0.0003	0.0137

Independent Variables	Model DF	Error DF	MSE	R-Sq	Adj R-Sq	P
ITED_M, HLM	2	16035	9.42	0.5956	0.5956	<.0001
ITED_M, Alg_II	2	16035	10.64	0.5432	0.5432	<.0001
ITED_M, Gender	2	16035	10.76	0.5381	0.5380	<.0001
ITED_M, ACT_Core	2	13959	10.69	0.5374	0.5374	<.0001
ITED_M, District Enrollment	2	15927	10.83	0.5353	0.5353	<.0001
ITED_M, F/R	2	16035	10.84	0.5346	0.5345	<.0001
HLM, ACT_Core	2	13959	14.99	0.3514	0.3513	<.0001

Independent Variables	Model DF	Error DF	MSE	R-Sq	Adj R-Sq	Parameter Est	P
ITED_M, HLM, F/R, Race, Gender, ACT_Core, District Enrollment	7	13867	9.12	0.6052	0.6050		<.0001
Intercept						19.6693	<.0001
ITED_M						2.7269	<.0001
HLM						1.3222	<.0001
F/R						-0.3995	<.0001
Race						-0.5274	0.0007
Gender						0.7976	<.0001
ACT_Core						0.7640	<.0001
District Enrollment						0.00002777	<.0001

Table 24 also shows the result of the multiple-regression model with seven main effect predictors. The R-Square was .6052 when ITED z-score, HLM courses taken, gender, free or reduced lunch eligibility, race/ethnicity, ACT core and district enrollment were all in the model. Results in Table 24 demonstrate that almost 60 percent of the ACT Mathematics score variance was shared with the combination of the ITED z-score and HLM courses taken, the shared variance went up less than 1 percent when the other five predictors were added in a multiple regression model.

Higher level mathematics courses taken have a strong impact on ACT Mathematics scores for all students in the study across all achievement levels. The HLM courses taken have a positive impact on ACT Mathematics scores for students eligible for free or reduced price lunch as well as those not eligible. Further, results suggest that all race/ethnicity groups, African American, American Indian and Hispanics as well as Asian and white, benefit from taking HLM courses as evidenced by their significant gains in ACT scores.

Table 25 — The ACT Mathematics Scores by Higher Level Mathematics Course Taken and ITED Achievement Level for Students Not Eligible for Free/Reduced Lunch

Students were NOT Eligible for Free/Reduced Price Lunch		Achievement Level				
		<41	41-75	76-89	90-94	95-99
Didn't Take HLM Course	Number of Students	650	2,582	1,237	463	247
	Avg. ACT Math	16.12	18	20.54	22.42	24.62
	STD. ACT Math	1.97	2.52	2.98	3.19	3.77
Took HLM	Number of Students	177	2,091	2,720	1,866	2,310
	Avg. ACT Math	17.73	20.40	23.17	25.29	28.32
	STD. ACT Math	3.10	3.30	3.28	3.20	3.62
	ACT Mathematics Score Gap	1.61	2.40	2.63	2.87	3.70
% Students Took HLM		21.4%	44.7%	68.7%	80.1%	90.3%
Effect Size for ACT Score Gain		0.69	0.77	0.77	0.84	0.98

Table 26— The ACT Mathematics Scores by Higher Level Mathematics Course Taken and ITED Achievement Level for White and Asian Students

White and Asian Students		Achievement Level				
		<41	41-75	76-89	90-94	95-99
Didn't Take HLM Course	Number of Students	685	2,812	1,365	486	265
	Avg. ACT Math	16.12	17.95	20.40	22.38	24.61
	STD. ACT Math	1.99	2.50	2.97	3.26	3.72
Took HLM	Number of Students	186	2,216	2,868	1,971	2,422
	Avg. ACT Math	17.73	20.40	23.17	25.29	28.32
	STD. ACT Math	3.06	3.28	3.27	3.22	3.60
	ACT Mathematics Score Gap	1.61	2.45	2.77	2.91	3.71
% Students Took HLM		21.4%	44.1%	67.7%	80.2%	90.1%
Effect Size for ACT Score Gain		0.69	0.79	0.81	0.85	0.98

Table 27 ─ The ACT Mathematics Scores by Higher Level Mathematics Course Taken and ITED Achievement Level for African American, American Indian and Hispanic Students

African American, American Indian and Hispanic Students		Achievement Level				
		<41	41-75	76-89	90-94	95-99
Didn't Take HLM Course	Number of Students	136	174	32	9	4
	Avg. ACT Math	15.00	17.63	19.88	22.44	24.25
	STD. ACT Math	1.44	2.39	3.24	3.24	2.22
Took HLM	Number of Students	24	124	72	51	28
	Avg. ACT Math	17.04	18.88	22.86	24.57	26.75
	STD. ACT Math	2.56	2.82	3.23	3.09	3.77
	ACT Mathematics Score Gap	2.04	1.25	2.98	2.13	2.50
% Students Took HLM		15.0%	41.6%	69.2%	85.0%	87.5%
Effect Size for ACT Score Gain		1.13	0.47	0.85	0.67	0.68

Both female and male students benefit from taking HLM courses in all pre coursework achievement levels. The students with high ITED Mathematics scores to begin with had a greater proportion taking HLM courses which greatly impacted their ACT scores. The students in small schools/districts had a lower proportion taking HLM courses compared to their peers in larger schools/districts, however, for any students who took HLM courses, their ACT Mathematics score gains were significant in terms of the large effect sizes shown. The results suggest that while earlier achievement does play a role in predicting later achievement it is not the only contributor. Students that were earlier in lower achievement levels also saw significant gains in later achievement when combined with rigorous coursework. This suggests that regardless of race/ethnicity, gender or socioeconomic differences, the introduction to more difficult courses during high school will impact subsequent performance thus increasing the likelihood of postsecondary education and future career success.

The average daily attendance rate differs significantly among SES and race/ethnicity groups in Iowa. The rate for students not eligible for free or reduced price lunches is 0.04 higher than that of students eligible for free or reduced price lunches (0.90). African American students had an average rate of 0.84 compared to 0.90 for Hispanic students and 0.93 for White students.

Figure 42 — Average Daily Attendance Rates

Average Daily Attendance (ADA) Rates for Iowa Subgroups 2008-2009

Subgroup	ADA Rate
All students	94%
Eligible	93%
Not Eligible	95%
IEP	93%
Non-IEP	95%
ELL	94%
Non-ELL	94%
African American	91%
Asian	95%
Hispanic	93%
Native American	91%
White	95%
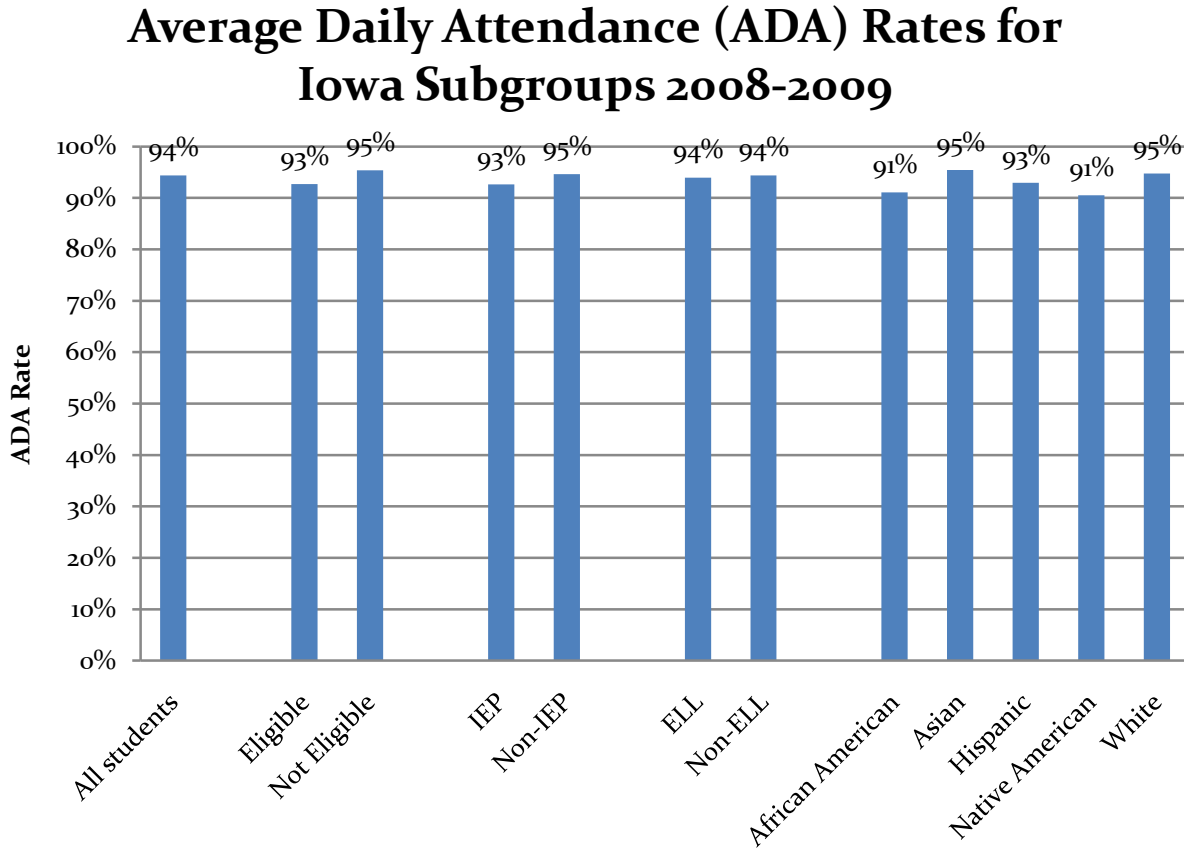
Figure 43 — Average Daily Attendance Rates by Race/Ethnicity

FRL Eligible by Race/Ethnicity
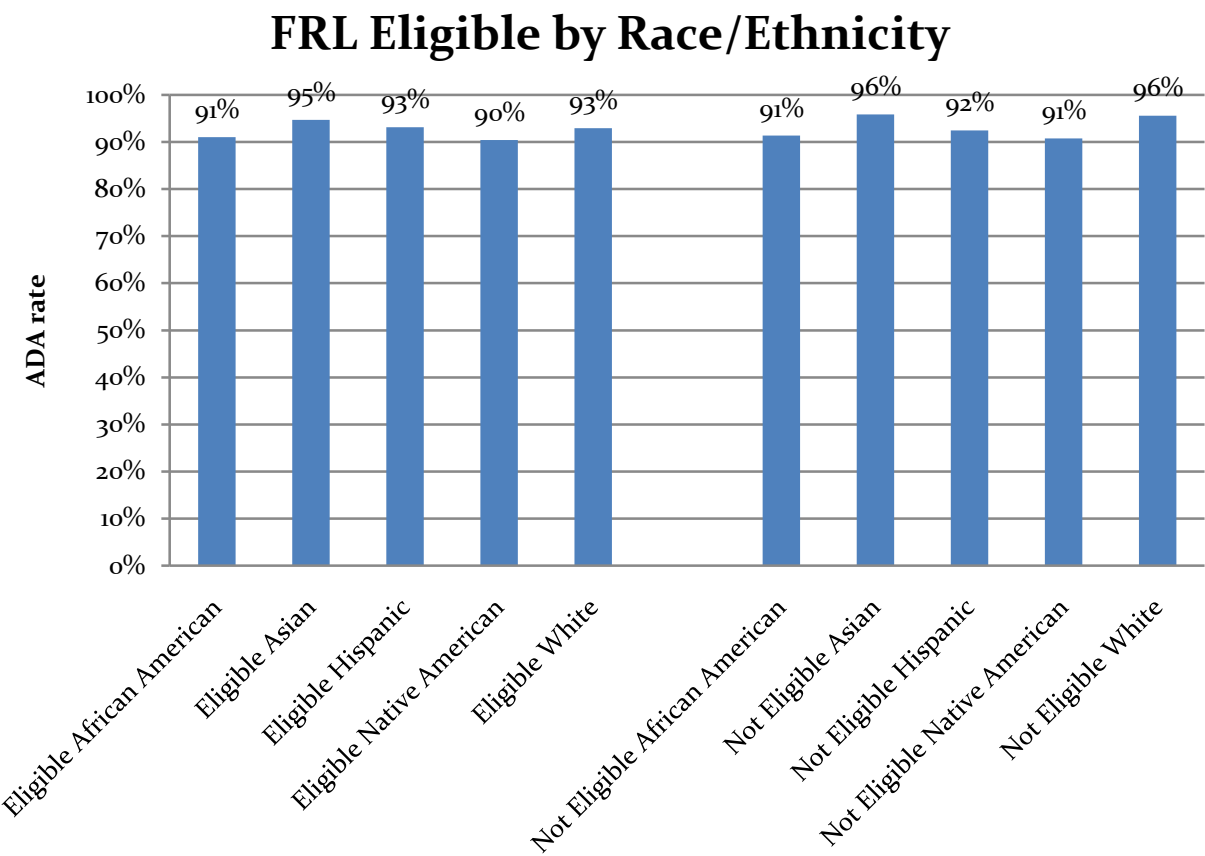
Figure 44 — Average Days Missed by Race/Ethnicity

Average Days Missed (Based on 180 Day School Year)
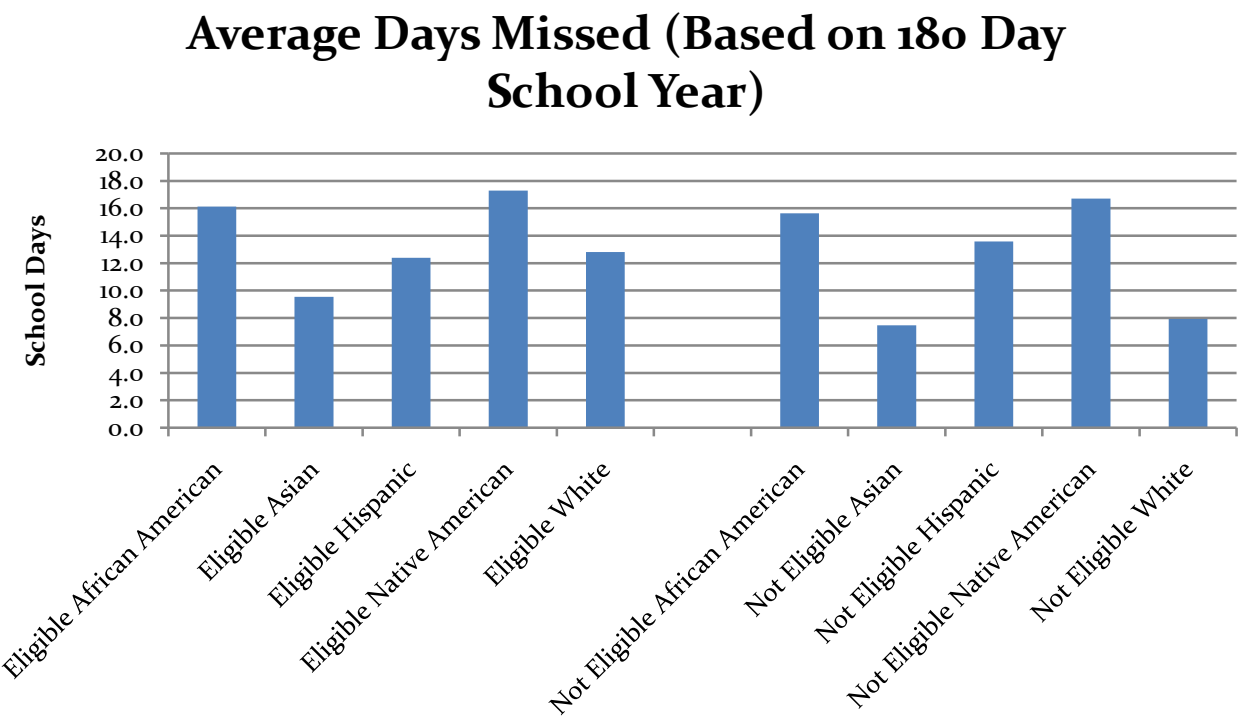
Dropout Rate Gaps

Iowa is one of the five states in the Nation that has a low dropout rate. Iowa's dropout rates have been less than two percent for grades 7-12 and less than three percent for grades 9-12 since 1998. However, each year the total number of dropouts numbers over four thousand students in grades 7 through 12 in Iowa. During the last 16 years, the lowest dropout rates for grades 7-12 and grades 9-12 occurred in 2003. The Iowa Department of Education (IDE) followed the federal guidelines of No Child Left Behind (NCLB) to report the students who left high school to earn a General Educational Development (GED) or adult education diploma as dropouts. This is one of the main reasons for the dropout rate increase for 2004. In 2008, an extra effort was made by the IDE to follow-up the missing students between data collections (for example, to follow-up the schools with missing students from fall to spring and from grades 9 to 10). This is likely one of the main reasons for the 2008 dropout rate increase.

Figure 45 — Overall Dropout Rate in Iowa
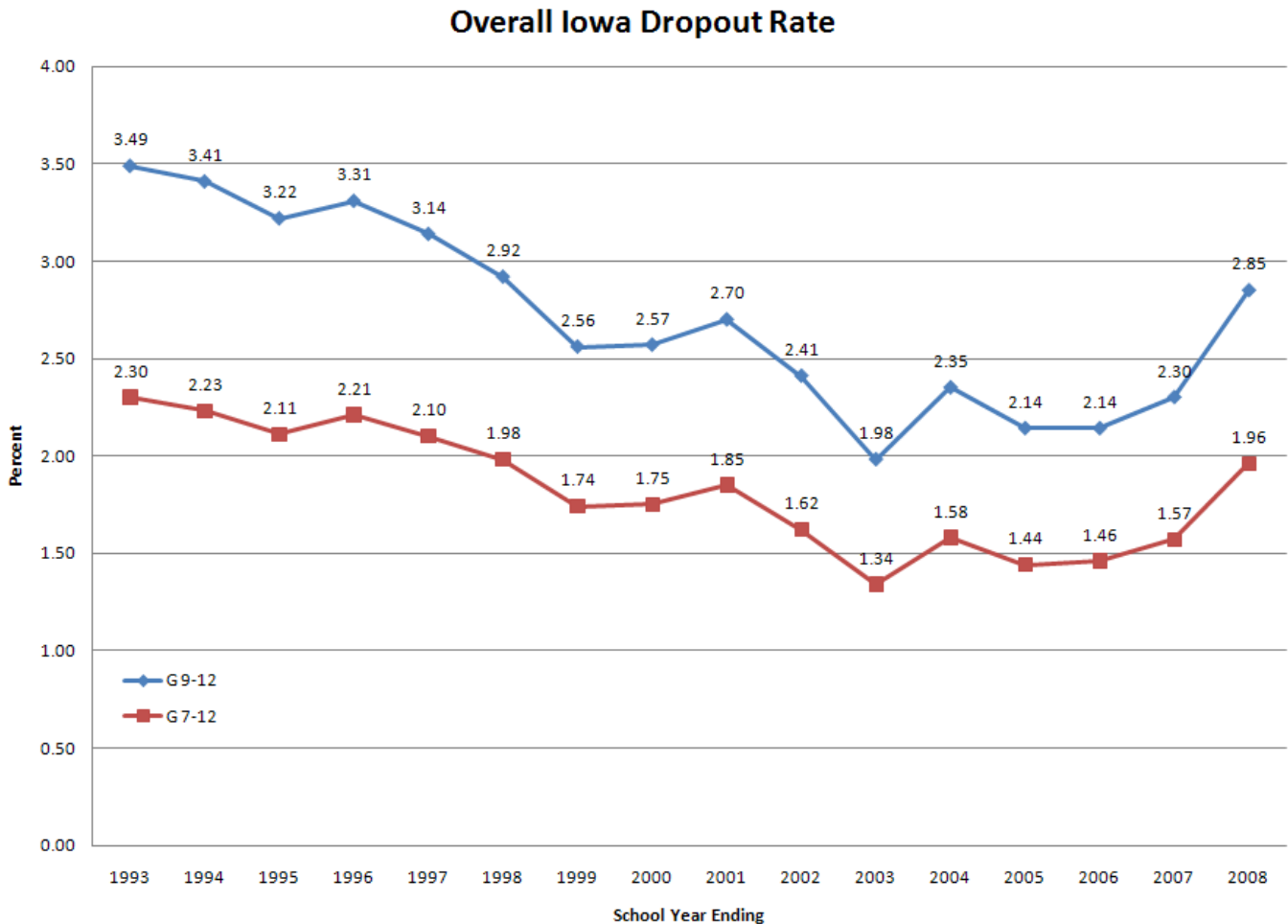
Overall Iowa Dropout Rate

Source: Iowa Department of Education, Basic Educational Data Survey (BEDS) and Project Easier Dropout Files

There are higher dropout rates for the students who are eligible for free or reduced-price lunch (F/R Eligible) than the students who are not eligible (F/R Not Eligible, See Figure 19).

Figure 46 ─ Dropout Rates by Free/Reduced Price Lunch 2007-2008
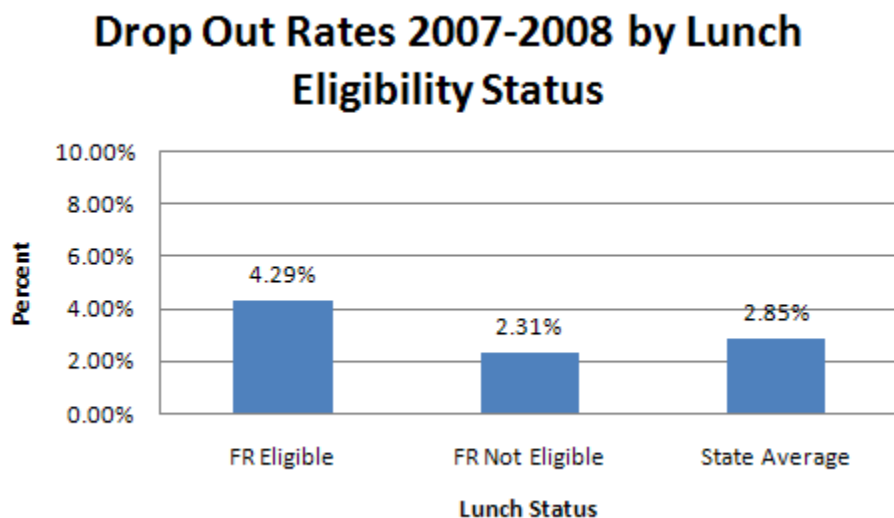
Drop Out Rates 2007-2008 by Lunch Eligibility Status

Source: Iowa Department of Education, Basic Educational Data Survey (BEDS) and Project Easier Dropout Files

There are higher dropout rates for some minority students including African American, Hispanic and American Indian than for White and Asian students (Figure 47).

Figure 47 ─ Dropout Rates by Race/Ethnicity 2007-2008

Drop Out Rates 2007-2008 by Race/Ethnicity

Source: Iowa Department of Education, Basic Educational Data Survey (BEDS) and Project Easier Dropout Files

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